RM-E100V

SERVICE MANUAL

AEP Model

June, 1985

SPECIFICATIONS

Power requirements	6-9 V DC (supplied from the player)
Power consumption	0.5 W
Dimensions	Approx. 355 × 40 × 160 mm (w/h/d) (14 × 1⅝ × 6⅜ inches) incl. projecting parts and controls
Weight	Approx. 850 g (1 lb 14 oz) incl. the cords attached

Inputs and outputs

CONTROL L	Round, 5-pin connector (1)
CAMERA REMOTE OUT	Minijack (1)
CONTROL S OUT	Minijack (1)

OPTIONAL ACCESSORIES

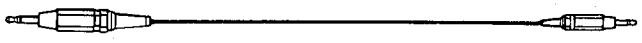
Remote control unit RMT-E1S
Connecting cord CCK-2MPE
(3 phono plugs and 1 miniplug ↔ 14-pin K-type connector, with mini → special mini plug adaptor and pin → BNC adaptor)

Whilst the information given is true at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We would ask you to check with your appointed Sony dealer if clarification on any point is required.

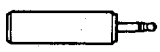
Accessories supplied
Connecting cord (5-pin to 5-pin) (1)

Connecting cord (miniplug to miniplug) (1)

Connecting cord (miniplug to special miniplug) (1)



Plug adaptor (converts miniplug to extra-miniplug)



MICROFILM

VIDEO EDITING CONTROLLER

SONY®

ACC

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SECTION 1
GENERAL

1-1. PRECAUTIONS

On Safety

- Do not open the cabinet. Refer servicing to qualified personnel only.
- Should any liquid or solid object fall into the cabinet, disconnect the power source and have the unit checked by qualified personnel before operating it any further.

On installation

Do not install the unit near a heat source such as a radiator or an air duct, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

On cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

If you have any questions about this unit contact your Sony dealer.

Caution

Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized duplication of such material may be contrary to the provisions of the copyright laws.

1-2. FEATURES

The RM-E100V video editing controller allows you to control an 8 mm format video camera recorder together with another video camera recorder or with a video tape recorder (VTR) listed below either simultaneously or individually. A variety of useful functions for tape-to-tape editing is provided.

Automatic assemble editing

Up to 8 desired programmes can be memorized in this unit and edited automatically in a desired sequence simply by pressing a button.

Editing rehearsal "PREVIEW"

It is possible to play back and check the memorized programmes before actual editing.

Programme play

The memorized programmes can be played back in sequence.

8 mm video camera recorder and Ⓑ Beta or VHS format VTR connection

As you can connect a Ⓑ Beta or VHS format VTR as well as an 8 mm format video camera recorder as the recording VTR, you can edit what is recorded on an 8 mm video cassette tape onto a Ⓑ Beta or VHS cassette tape easily and fast with this controller.

Large LCD (Liquid Cristal display) window

The tape counter and operation mode of the VTR (or video camera recorder), etc. can be monitored at a glance.

THE VIDEO CASSETTE RECORDERS USED WITH THIS UNIT

In this manual, the video tape/camera recorder used for playback is called "the player" and the video tape/camera recorder used for recording is called "the recorder".

As a player*

A video camera recorder (such as the Sony CCD-V8 series) equipped with REMOTE connector (5-pin, round)

As the recorder*

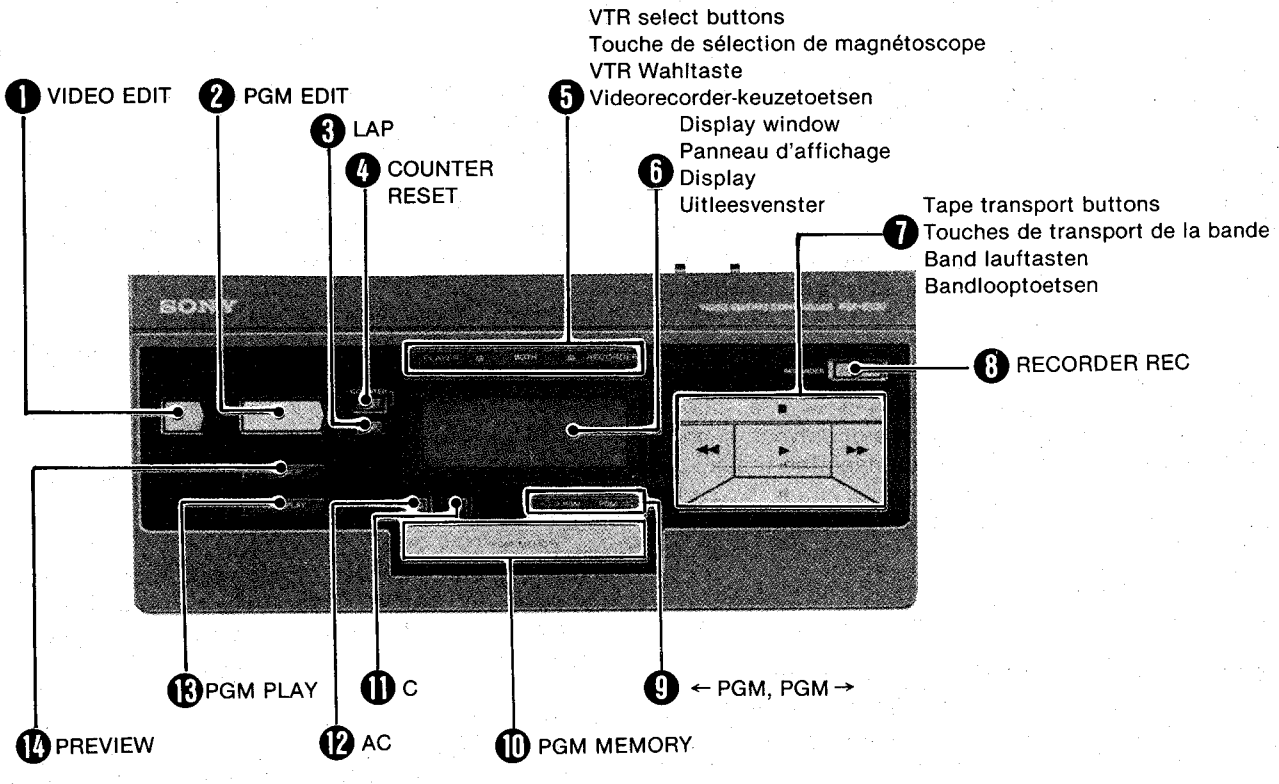
- A video camera recorder (such as the Sony CCD-V8 series) equipped with REMOTE connector (5-pin, round)
- Ⓑ Beta format video tape recorder equipped with CONTROL IN/CONTROL S IN (input) jack (minijack)
- Ⓑ Beta format video tape recorder equipped with CAMERA REMOTE IN/CAMERA PAUSE jack (special minijack) or CAMERA connector (14-pin, K type)
- JVC (VHS format) video tape recorder equipped with CAMERA PAUSE jack (minijack).
- Panasonic (VHS format) video tape recorder equipped with CAMERA REMOTE jack (extra-minijack)
- Sony infrared remote control video tape recorder**

*In the future, when VTRs with a CONTROL L jack (5-pin. round) is available, you will be able to connect such VTRs to this editing controller on the player's side and/or on the recorder's side. The connection would be the same as you would connect this VTR to the REMOTE jack of an 8 mm format video camera recorder as illustrated on pages 9-11.

**SL-C7 not included.

1-3. LOCATION AND FUNCTION OF CONTROLS

For details, refer to the pages indicated in parentheses.



❶ VIDEO EDIT button (page 14)
Press to start editing. The player starts playback and the recorder starts recording simultaneously. Press again to stop editing. Both VTRs will stop simultaneously.

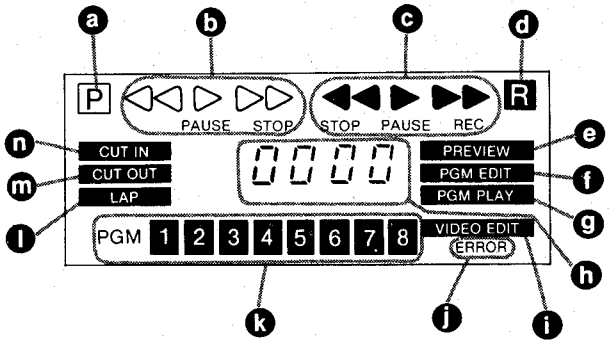
❷ PGM EDIT (programme edit) button (page 16)
After presetting the programmes to be edited, press to effect automatic assemble editing. To stop during editing, press the button again. The player stops, and the recorder goes into recording pause mode.

❸ LAP button (page 18)
This button is effective only when the player is equipped with a "time" counter (counter with "H,M,S" indicators).
Press the button to display the approximate total time of all the memorized programmes.

❹ COUNTER RESET button
When the green PLAYER lamp is lit, press this button to reset the counter for the player to "0000" (or, if the player's counter is a time counter, "0H00M00S"). When the recorder is connected to the CONTROL L connector, press the RECORDER button and then this button to reset the counter for the recorder to "0000" or "0H00M00S".

❺ VTR select buttons (page 13)
Press to select the VTR to be used. The corresponding lamp lights.
PLAYER button and green lamp
To operate the player.
RECORDER button and red lamp
To operate the recorder.
BOTH button
To operate both the player and the recorder. The green and red lamps light.
When the PREVIEW, PGM EDIT, PGM PLAY or VIDEO EDIT button is pressed, the lamp(s) light(s) automatically according to the VTR(s) in operation.

❻ Display window/Panneau d'affichage/Display/Uitleesvenster



ⓐ Lights when the player is connected.
ⓑ Show the tape operation mode of the player.
ⓒ Show the tape operation mode of the recorder.*
◀◀: rewind, ▶: playback, ▶▶: fast forward,
PAUSE: pause, STOP: stop, REC: recording

*Light only when the recorder is connected to the CONTROL L connector.

ⓓ Lights when the CTRL L/CTRL selector is set to CTRL L.
ⓔ Lights during the preview operation.
ⓕ Lights during the automatic assemble editing operation.
ⓖ Lights during the programme play operation.
ⓗ Displays the tape counter of the player.
ⓘ Lights when the VIDEO EDIT button is pressed for editing.
ⓙ Lights when a cut-in or cut-out point is set incorrectly or when a connection is made incorrectly.
ⓚ Programme numbers for automatic assemble editing. For each programme memorized, one of the numbers [1]–[8] lights to show the order in which the programme is to be edited. Up to 8 programmes can be memorized.
ⓛ Lights when the LAP button is pressed.
ⓜ Lights when a cut-out point is indicated on the tape counter or when the tape is in a portion between the cut-in point and the cut-out point of a programme.
ⓝ Lights when a cut-in point is indicated on the tape counter or when the tape is in a portion between the cut-out point of the previous programme and the cut-in point of the following programme.

ⓞ Tape transport buttons
These buttons activate the VTR(s) selected by the VTR select buttons. The functions of these buttons are the same as those of the VTRs.
◀◀ (rewind) button: Press to rewind the tape.
▶ (playback) button: Press to play back the tape.
▶▶ (fast forward) button: Press to advance the tape rapidly.
■ (stop) button: Press to stop the tape.
❚❚ (pause) button: Press to stop the tape momentarily during recording or playback. Press again to resume it. Easy and smooth repetition of stopping and then starting the recording can be done with this button to skip recording the unwanted portions of the playback tape. During playback, a still picture can be viewed.

ⓟ RECORDER REC (recording) button (page 14)
When the red RECORDER lamp is lit, press this button to start recording on the recorder.

ⓠ ← PGM, PGM → (programme) buttons (page 18)
Press to display the cut-in or cut-out point of a programme to be memorized, changed, eliminated or checked.

ⓡ PGM MEMORY (programme memory) button (page 16)
Press to have the cut-in or cut-out point of a programme memorized.

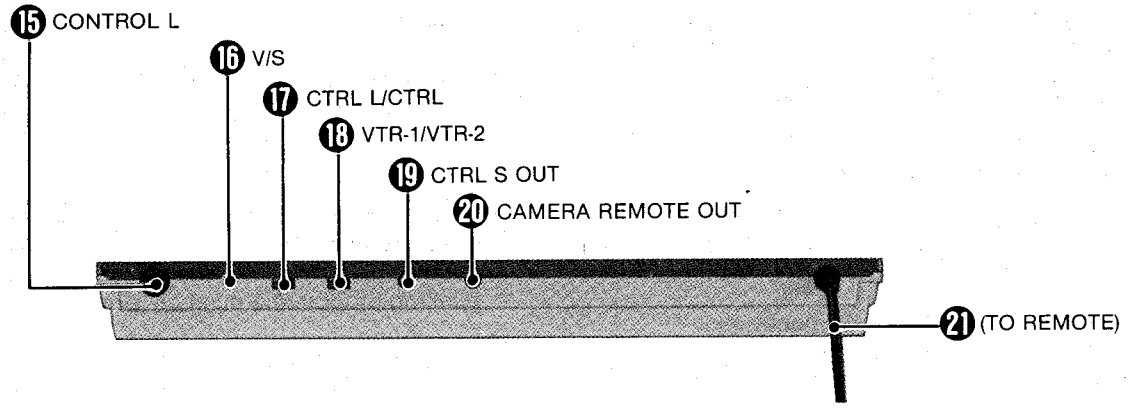
ⓢ C (clear) button (page18)
Press to erase the cut-in or cut-out point of a memorized programme. When this button is pressed, the tape counter displays "————" and the memory of the blinking programme number is erased.

ⓣ AC (all clear) button (page 18)
Press to erase the cut-in and cut-out points of all the memorized programmes. The display returns to the initial setting when the power was first turned on and all the programmes, including the setting of the VTR select buttons, are cleared.

ⓤ PGM PLAY (programme play) button (page 19)
Press to start programme play. The memorized programmes will be played back in sequence. Press again to stop programme play.

ⓥ PREVIEW button (page 17)
Press to preview the memorized programmes. The programmes will be played back in sequence between playback pauses for a few seconds at each cut-in and cut-out point. Press again to stop the tape during previewing.

Rear/Arrière/Rückseite/Achterpaneel



⑮ CONTROL L connector (round, 5-pin)
Connect to the REMOTE connector of the video camera recorder for recording.

⑯ V/S selector
Set as follows according to the type of the recorder.
S: For β Beta format VTRs*
V: For VHS format VTRs

*If you desire to control the SL-C9, SL-C5 and other SL-C series VTRs, SL-F series and SL-HF100 series VTRs **using the RMT-E1S** remote control unit, set this switch to "V".

⑰ CTRL L/CTRL selector
When the recorder is connected to the CONTROL L connector ⑮, set to CTRL L. Otherwise, set to CTRL.

⑱ VTR-1/VTR-2 selector
When the recorder is connected to the CTRL S OUT or CAMERA REMOTE OUT jack, set this selector as follows:

When the recorder is not equipped with a COMMAND MODE selector
VTR-1: For a Betamax video cassette recorder or a JVC VTR whose mini-type CAMERA PAUSE or CAMERA REMOTE IN jack is connected to the CAMERA REMOTE OUT jack of this controller
VTR-2: For a (8 mm format) video tape recorder using the VTR-2 remote control mode or a Panasonic VTR whose extra-mini type jack is connected to the CAMERA REMOTE OUT jack of this controller

When the recorder is equipped with a COMMAND MODE selector:
Set to the same position as the selector on the recorder.

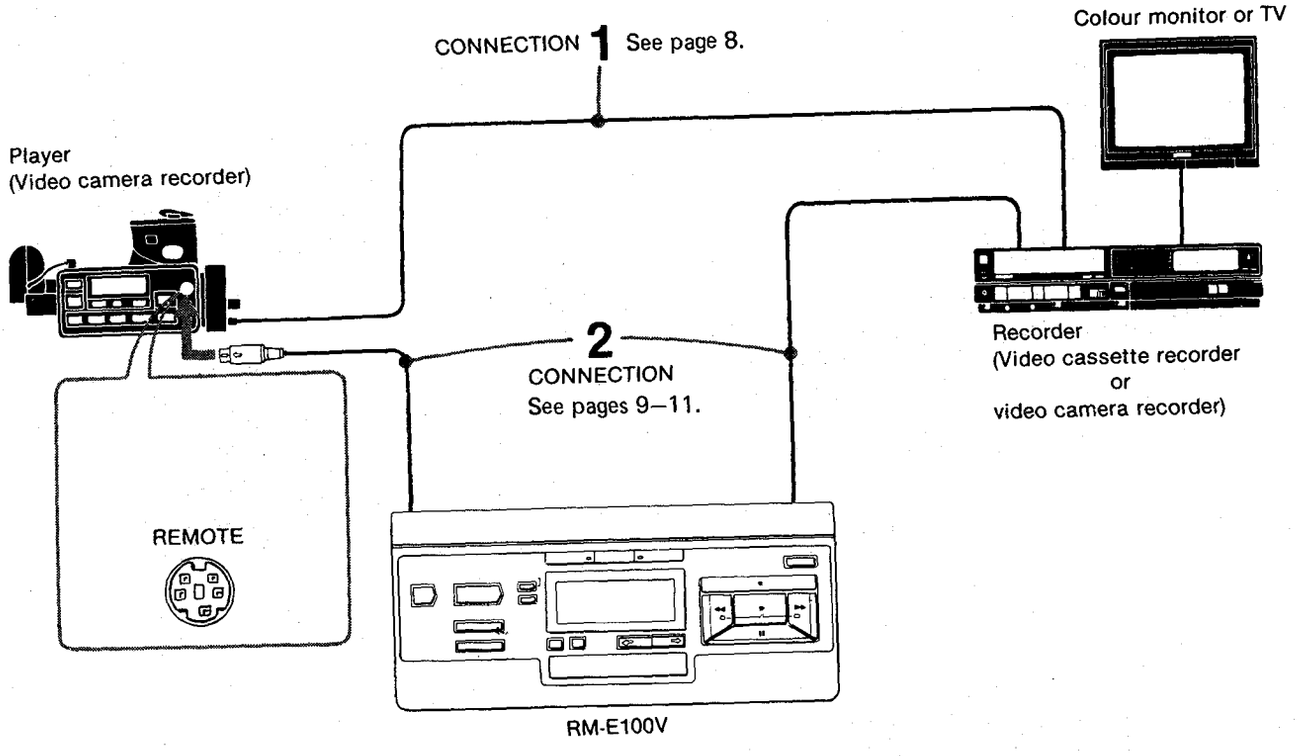
⑲ CTRL S OUT (control S output) jack (minijack)
Connect to the CONTROL IN or CONTROL S IN (input) jack of the recorder or of the optional RMT-E1S remote control unit.

⑳ CAMERA REMOTE OUT (camera remote control output) jack (minijack)
Connect to the CAMERA PAUSE or CAMERA REMOTE (IN) jack (minijack, special minijack or extra minijack), or the CAMERA connector (14-pin, K type) of the recorder.

㉑ (TO REMOTE) connecting cord (with round 5-pin connector)
Connect to the REMOTE connector of the video camera recorder for playback. The power of the camera recorder will be supplied to this controller by this connection.

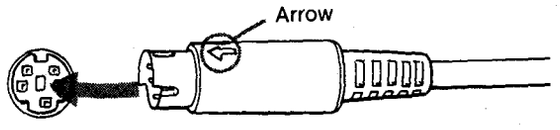
1-4. CONNECTIONS

First connect the player and the recorder, then connect the RM-E100V to both the player and the recorder.
The player should be equipped with the round, 5-pin REMOTE connector.



Notes

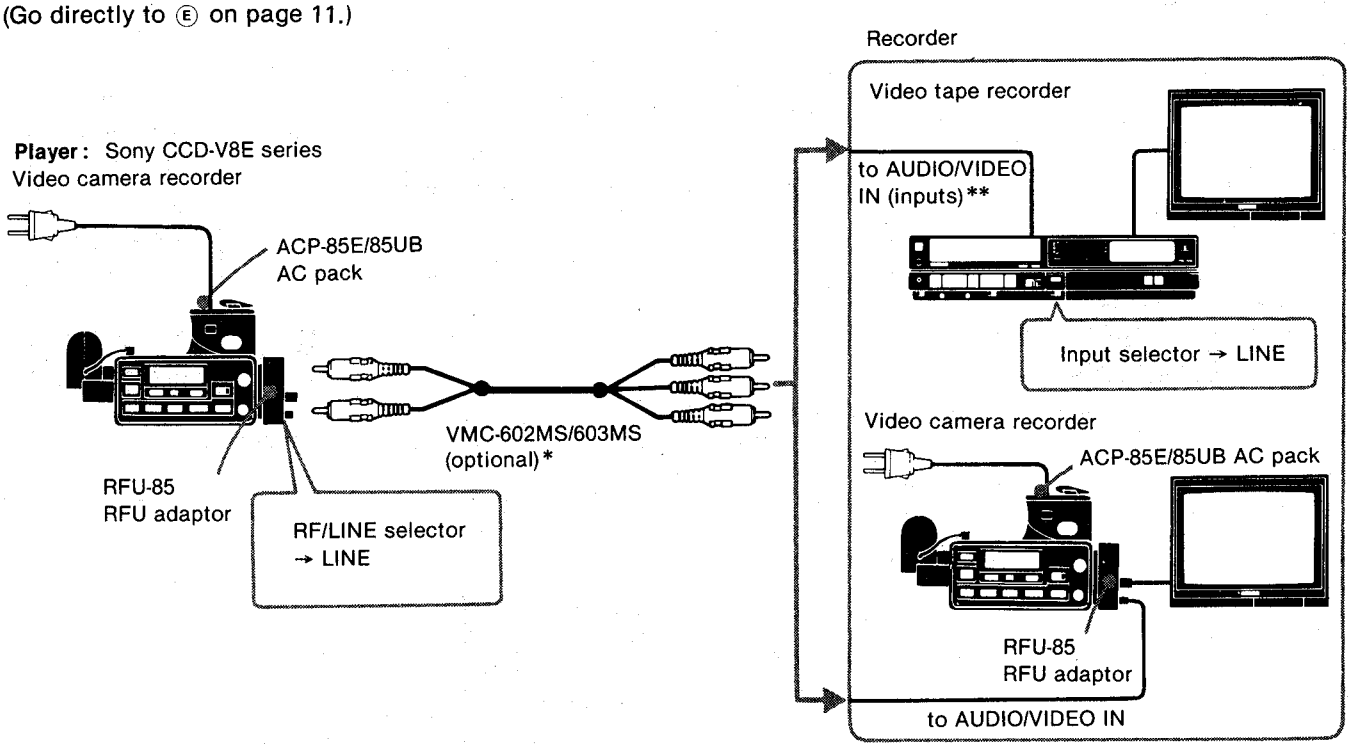
- Be sure to supply the power to the recorder and the player from a wall outlet (using an AC pack if necessary). Never use battery packs for the power source.
- Insert the plug of the (TO REMOTE) connecting cord with the arrow mark up, aligning the pins with the holes on the REMOTE connector.



- If your player and/or the recorder are equipped with a "MEMORY" button, **make sure that the MEMORY indicator of the unit is turned off.**

1 CONNECTION OF THE PLAYER AND THE RECORDER

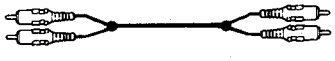
This connection is not necessary if the RM-E100V is to be connected to the CAMERA connector of the recorder. (Go directly to Ⓔ on page 11.)



- A color monitor or a TV can be connected to the player also. However, it cannot be used for monitoring the programs edited on the recorder.

*If the recorder is equipped with a monaural audio input jack, use the following optional connecting cords.

VMC-600M/601M (2 phono plugs → 2 phono plugs, with BNC plug adaptor)



VMC-600M/601M + PC-21 plug adaptor (converts phono plug into miniplug)

**Use the BNC connector supplied to the VMC-602MS/603MS for connection to the video input if necessary.

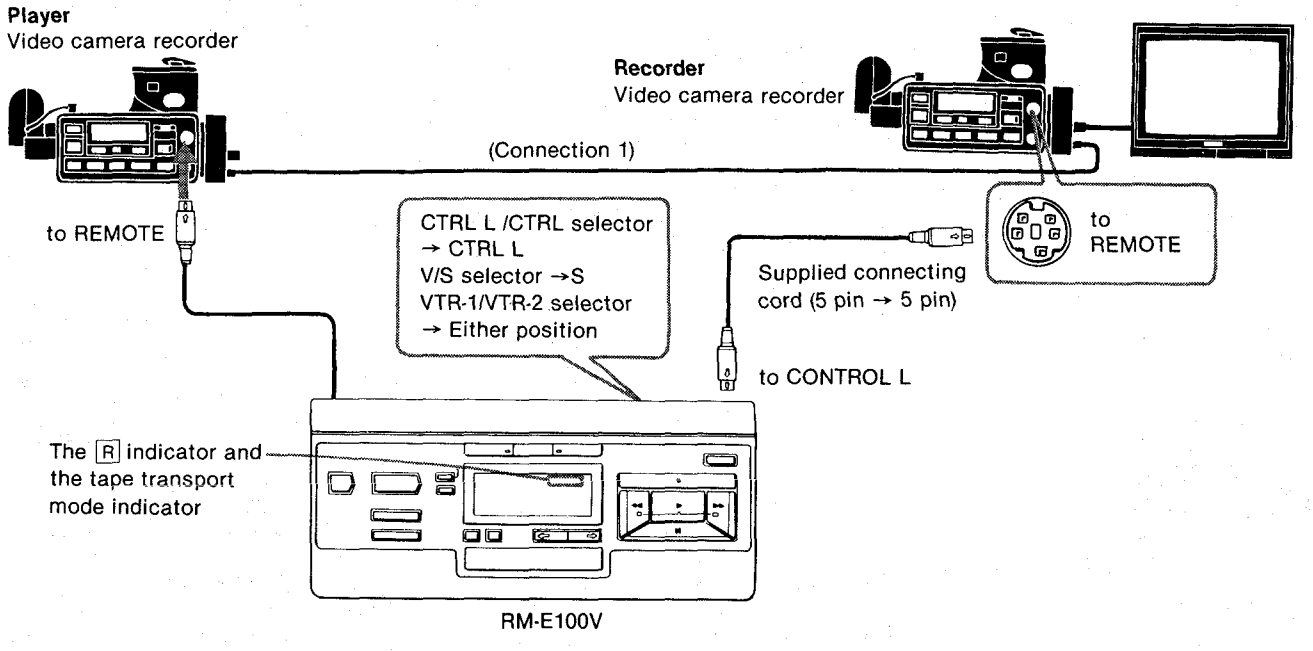
2 CONNECTION OF THE RM-E100V

The connection differs according to the connector or jack of the recorder.

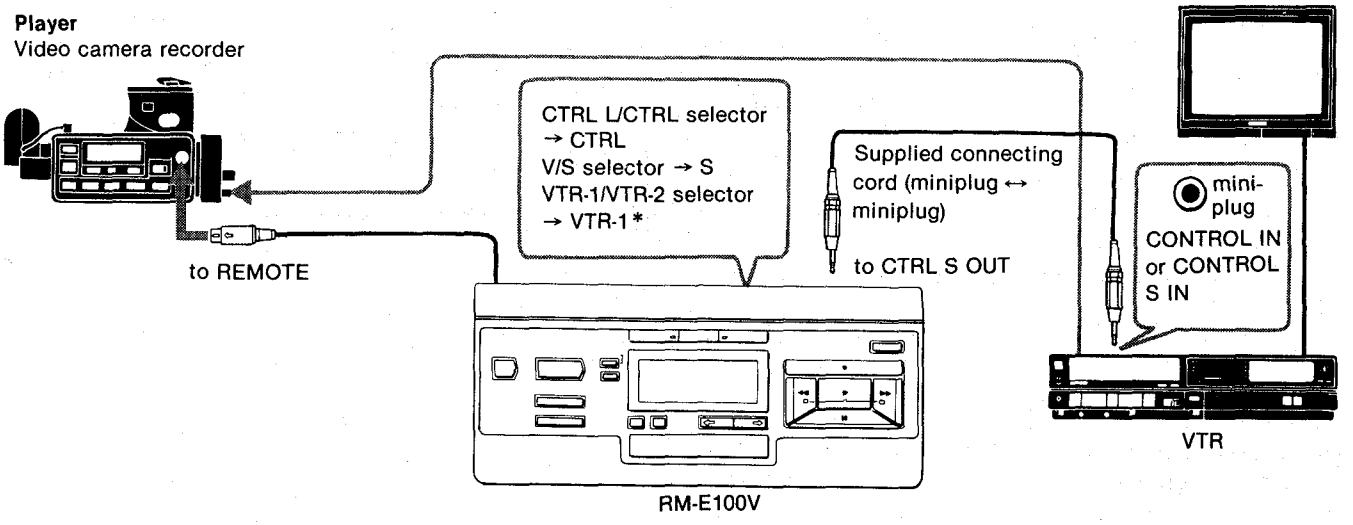
Notes

- With connections Ⓒ, Ⓔ, Ⓕ and Ⓖ, only the start and pause of recording during automatic assemble editing is controlled by this unit. The recorder cannot be operated by pressing the ◀◀, ▶▶, ▶ or ■ (tape transport) button, or by the RECORDER REC or VIDEO EDIT button on this unit. However, for connections Ⓒ and Ⓔ, if the recorder is a Sony infrared remote control VTR, you will be able to operate the recorder with these buttons by performing connection Ⓓ instead.
- For connections Ⓑ∼Ⓖ, the [R] indicator and the tape transport mode indicators for the recorder are not displayed in the display window.
- You cannot make more than one connection simultaneously on the recorder's side. This unit will control only one player and one recorder.

Ⓐ **When the recorder is equipped with the 5-pin REMOTE connector (with the configuration as illustrated below)**
Ex. CCD-V8 series video camera recorder

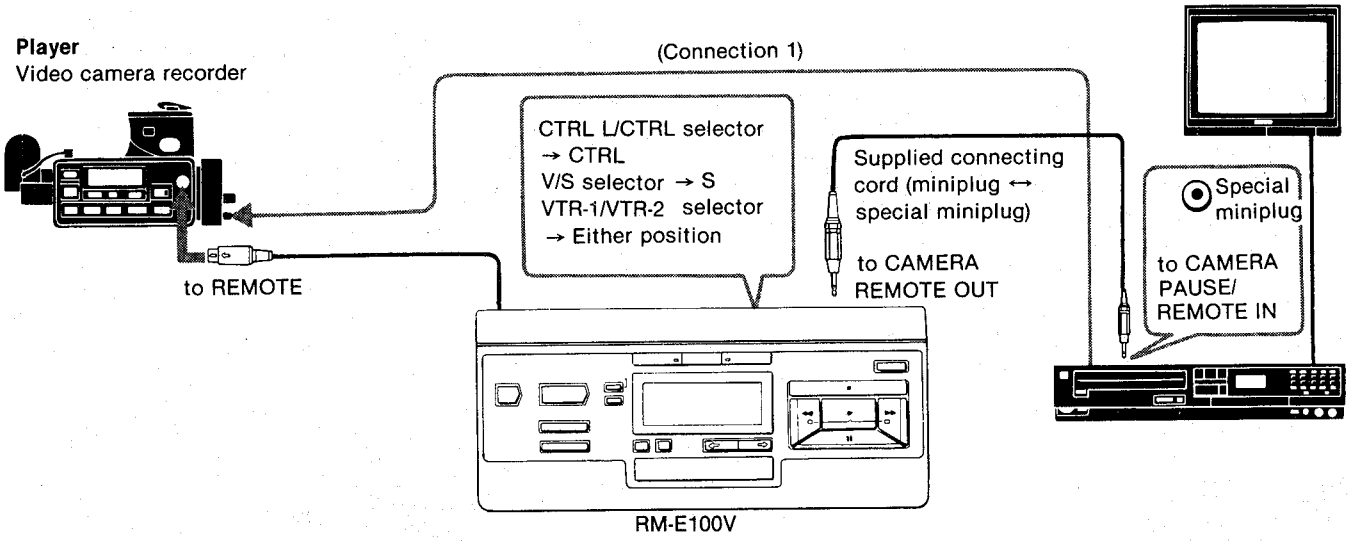


Ⓑ **When the recorder is a Ⓑ Beta format VTR equipped with the CONTROL IN or CONTROL S IN (input) jack**



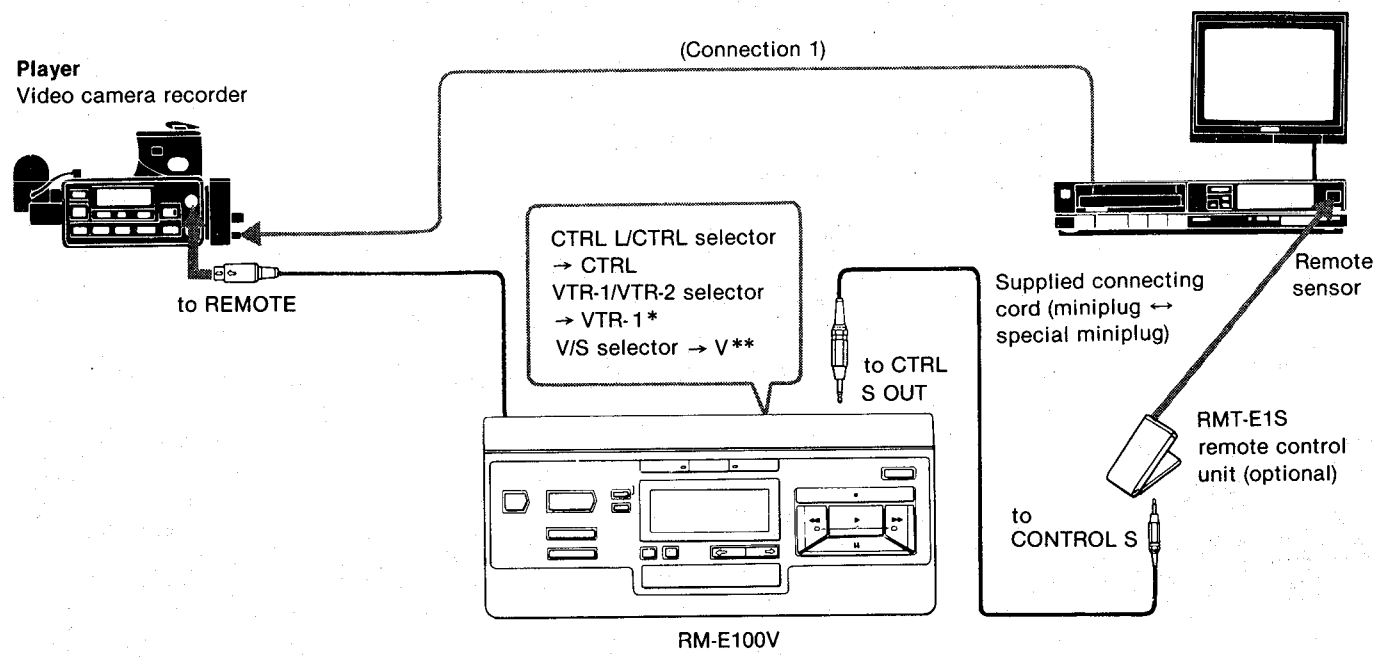
*When the remote control mode of the recorder is VTR-2 or when the COMMAND MODE selector of the recorder (if provided) is set to VTR-2, set to VTR-2.

Ⓒ **When the recorder is a [β] Beta format VTR equipped with the CAMERA PAUSE or CAMERA REMOTE IN jack**



Ⓓ **When the recorder is a Sony infrared remote control VTR**

The recorder can be controlled by this unit, via the optional RMT-E1S remote control unit.

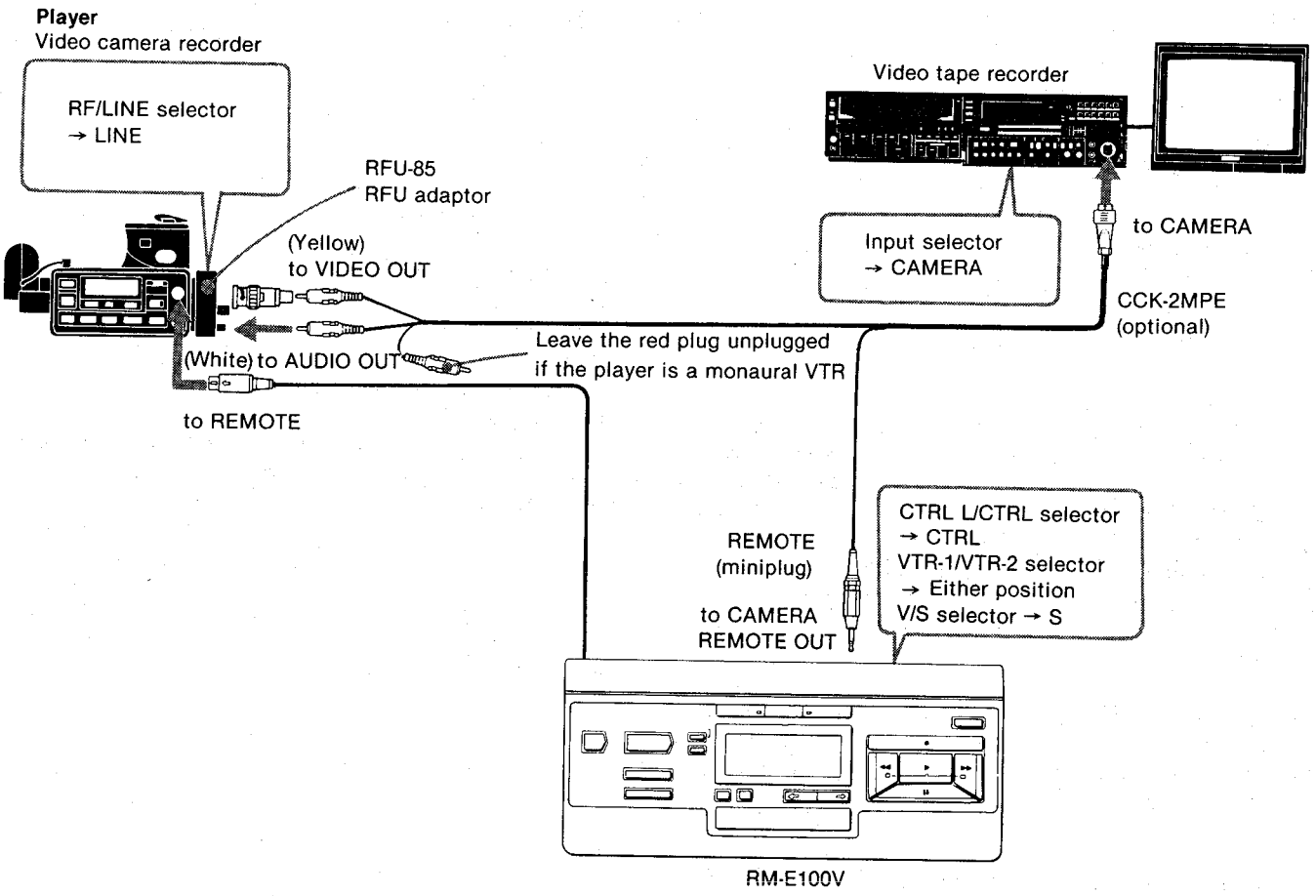


*When the remote control mode of the recorder is VTR-2, set to VTR-2.

**For Betamax VTRs ([β] marked) other than SL-C/SL-F/SL-HF100 series, set to "S".

- For installation of the remote control unit, refer to the instruction manual of the remote control unit. Incorrect installation may cause malfunction of the player.

Ⓔ **When the recorder is a β Beta format VTR equipped with the CAMERA connector (14-pin, K type)**



Ⓕ **When the recorder is a VHS format JVC VTR equipped with a mini type CAMERA PAUSE jack**

Perform connection ⓒ, except make the following changes:

- Use the supplied **(miniplug ↔ miniplug)** connecting cord to connect the CAMERA PAUSE jack of the VTR and the CAMERA REMOTE OUT jack of this unit.
- Set V/S selector to "V".
- Set VTR-1/VTR-2 selector to "VTR-1".

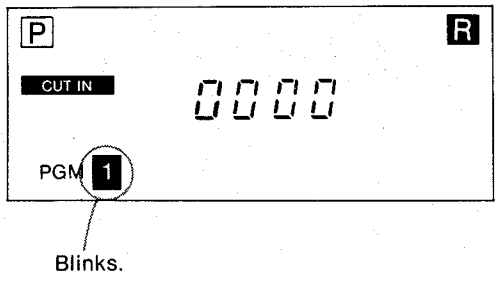
Ⓖ **When the recorder is a VHS format Panasonic VTR equipped with an extra-mini type CAMERA REMOTE jack**

Perform connection ⓒ, except make the following changes:

- When connecting the CAMERA REMOTE OUT jack of this unit to the VTR, connect one end of the supplied **(miniplug ↔ miniplug)** connecting cord to the CAMERA REMOTE OUT jack of this unit, then connect the other end of the cord to the CAMERA REMOTE jack using the supplied plug adaptor (mini → extra mini).
- Set V/S selector to "V".
- Set VTR-1/VTR-2 selector to "VTR-2".

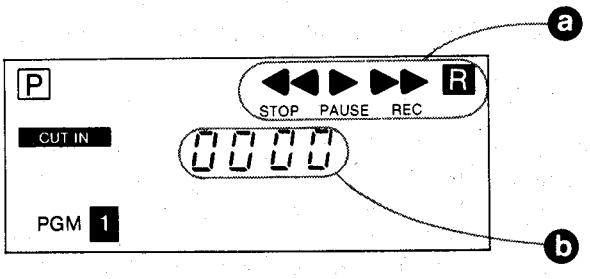
1-5. DISPLAY WINDOW

PROGRAMME NUMBER



When the player is turned on, the tape counter in the display window indicates "————" for a few seconds, then indicates the same contents as the tape counter on the player. The programme number (PGM [1] for the above example) will start blinking.
The programme number continues blinking during normal tape operation. When a programme is memorized for automatic assemble editing, the number for the programme will change to remain lit and the next programme number starts blinking. Up to 8 programmes can be memorized in the PGM (programme) [1] to [8] positions. The numbers of the memorized programmes will remain lit after automatic assemble editing, preview and programme play operations.

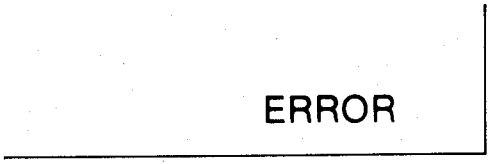
INDICATIONS DEPENDING ON THE CONNECTED EQUIPMENT



ⓐ These indications appear only when the recorder is connected to the CONTROL L connector.
ⓑ The tape counter shows the same contents as the tape counter on the player.
If the player is equipped with a "time" counter, the counter will be of 5 digits and the minus sign, H, M and S indicators will also appear.

The illustrations used in this manual show the case when the recorder is connected to the CONTROL L connector and the player's counter is a tape (4 digits) counter.

ERROR INDICATOR



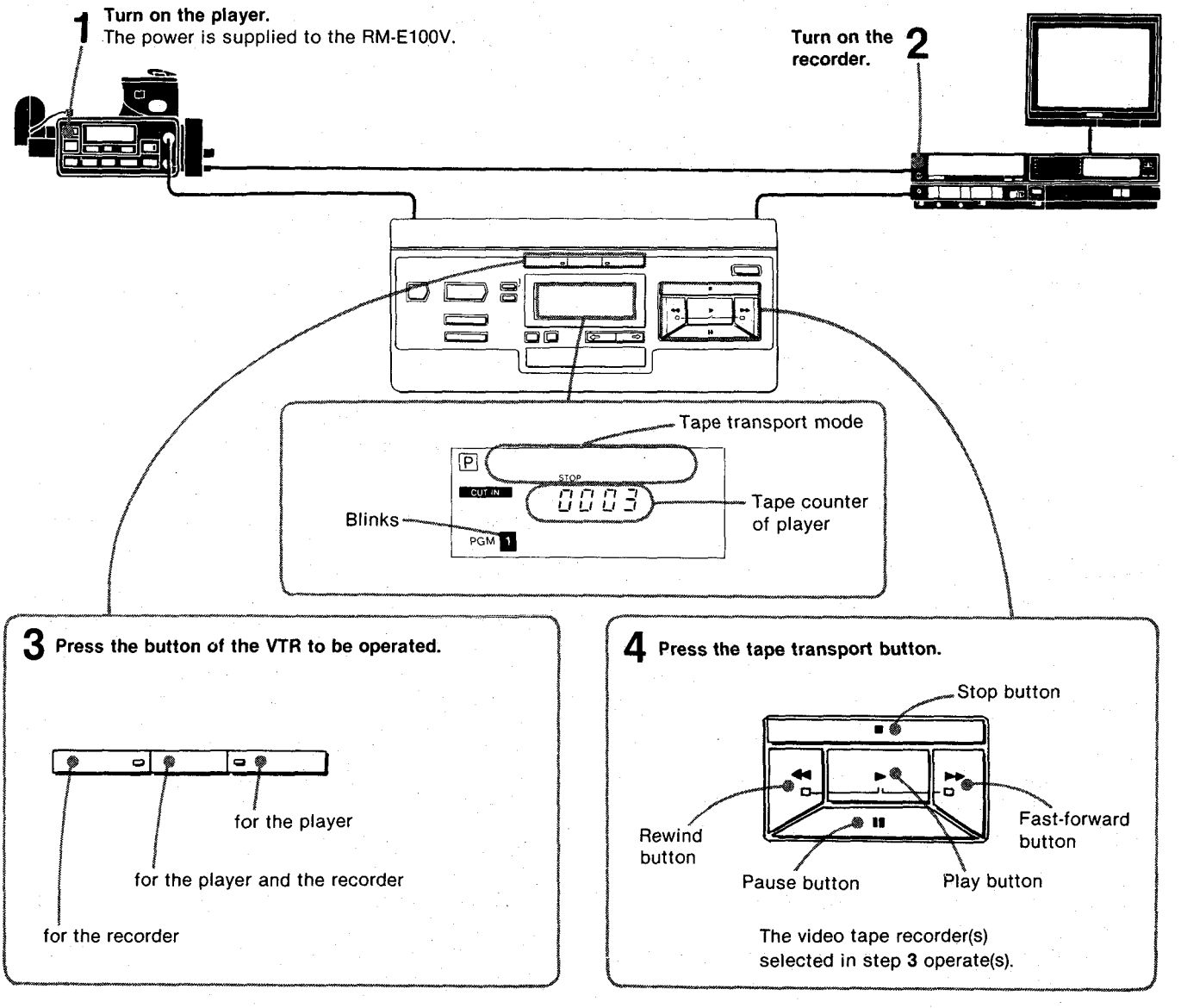
The ERROR indicator blinks in the following cases :
- When nothing is connected as the recorder
- When the CONTROL selector is set incorrectly
- When both the CTRL S OUT and CAMERA REMOTE OUT jacks are connected and the CONTROL selector is set to "CONTROL".

This indicator also blinks when the cut-in and cut-out points for automatic assemble editing are not set correctly. Refer to page 17.

1-6. OPERATION OF THE PLAYER AND THE RECORDER

Tape transport on the player and the recorder* can be controlled by the tape transport buttons on this unit.

*The recorder connected to the CAMERA REMOTE OUT jack cannot be controlled by the tape transport buttons on this unit.



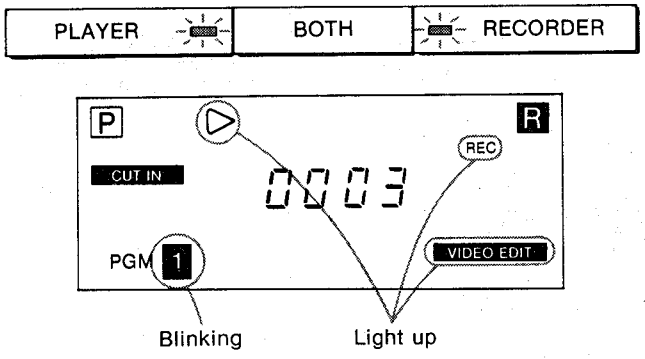
- If the player and/or the recorder are provided with the picture search, skip scan and automatic rewind functions, these functions can also be activated with the tape transport buttons on this unit.
- The tape transport buttons on the player and the recorder are operative even when this unit is connected.

1-7. BASIC EDITING MODES

For the recorder connected to the CAMERA REMOTE OUT jack, these modes cannot be activated.

TO EDIT THE ENTIRE TAPE CONTENTS TO ANOTHER TAPE

1 Press the PLAYER button and the ◀◀ button to rewind the tape on the player to the beginning.
2 Press the RECORDER button and the ◀◀ button to rewind the tape on the recorder to the beginning.
3 Press the VIDEO EDIT button. Editing begins.



The lamps of the PLAYER and RECORDER buttons light automatically.

If editing does not seem to begin when the VIDEO EDIT button is pressed once, try pressing the same button again.

Editing can also be started in the middle of the tape by pressing the VIDEO EDIT button.

To stop editing
Press the VIDEO EDIT button again. The player and the recorder are set to the stop mode and the VIDEO EDIT indicator disappears.

Notes
- During editing, the tape transport buttons are inoperative.
- The recorder stops automatically when the tape of the player reaches the end.
- Editing does not begin when the recorder is in recording pause mode.

MANUAL ASSEMBLE EDITING
—To edit only desired scenes while viewing playback

1 Press the PLAYER button.
2 Press the ▶ button. The player starts playback.
3 Press the RECORDER button.
4 At the point where you want to start recording, press the RECORDER REC button.

To pause recording
Make sure the lamp on the RECORDER button is lit and press the ❚❚ button.

To resume recording
Press the ❚❚ button again.
To protect the video heads and the tape, pause mode will be released automatically after about 8 minutes and the recorder will be set to stop mode or (depending on the recorder) resume recording.

To stop recording
Press the ■ button.

To stop playback
Press the PLAYER button and then the ■ button.

TO START RECORDING FROM THE RECORDING PAUSE MODE

Smoother starting of recording can be made from the recording pause mode than from the stop mode. When starting recording, simply press the ❚❚ button of this controller after following the steps below.

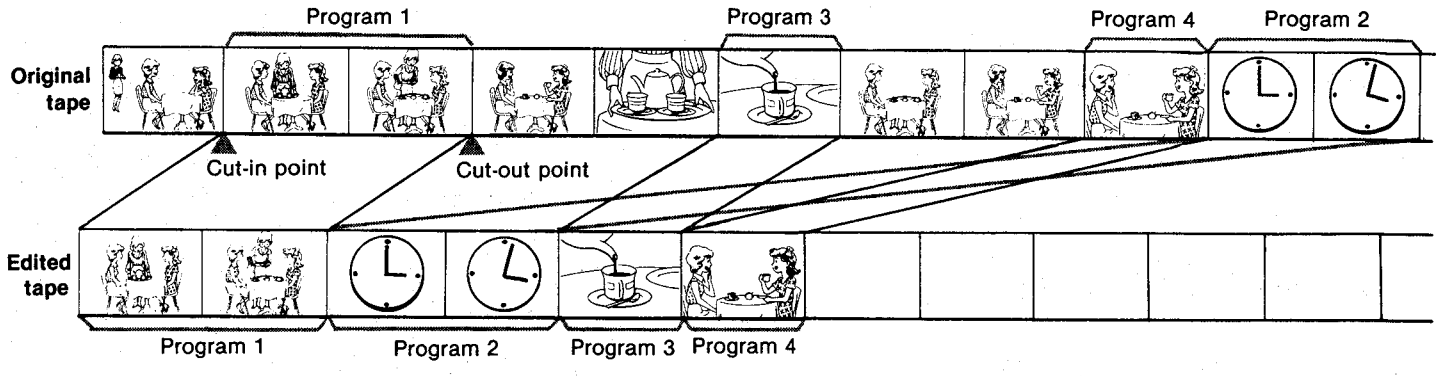
For video camera recorders/ Beta VTRs
1 Press the RECORDER button so the lamp of the button lights.
2 Press the ▶ button and locate the point where you want to start a new recording (using the picture search, or other playback functions that can be activated on your recorder).
At the desired point, press the ❚❚ button.
3 Press the RECORDER REC button.
The recorder goes into recording pause mode and the picture being played back on the player can be viewed on the monitor or TV connected to the recorder.

For VHS format VTRs
1 Perform 1 and 2 above.
2 Set the recorder to the recording mode using the buttons on the recorder.
(The recorder will automatically be in the recording pause mode.*)

*If recording starts instead, press the VTR select "RECORDER" button and then press ❚❚ (pause) button. (Press again if recording does not pause.) **Do not** press the ❚❚ pause button on the recorder itself, as this will cause malfunction of the start and pause function of the recorder.

Note
When recording is resumed after the tape has been stopped with the ■ button or from recording pause mode, it is possible that a "rainbow effect" or a distorted picture will be seen in between the recordings when they are played back.

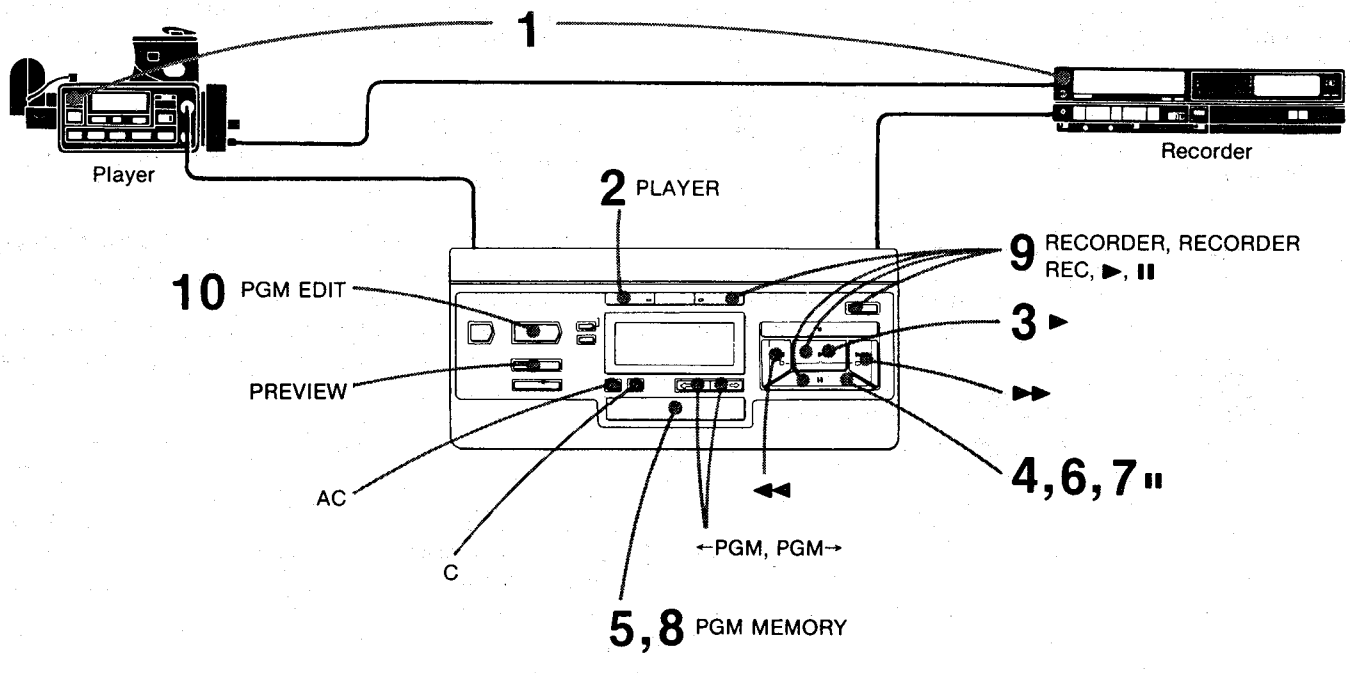
1-8. AUTOMATIC ASSEMBLE EDITING



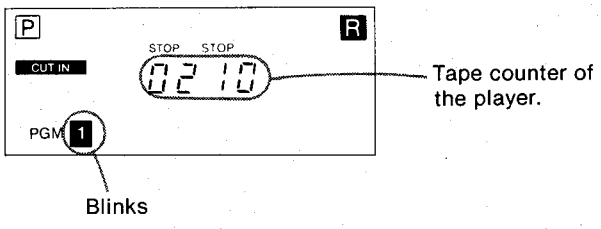
In automatic assemble editing mode, only the required scenes on a tape can be edited to another tape automatically in the desired sequence. Preset the cut-in and cut-out points of the required scenes in the order to be edited. Simply by pressing the PGM EDIT button, editing will proceed automatically. Up to 8 scenes can be edited.

Note

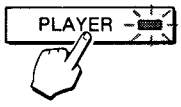
- On certain VTRs, it is possible that a "rainbow effect" or a distorted picture will be seen in the playback of the portions where the previously recorded and newly recorded portions overlap.
- Depending on the player and/or recorder, te cut-in and -out points that have been preset will be shifted by a small amount when the actual assemble editing is made and will be shifted more if the editing is repeated. We recommend that you try out the results with your player and recorder and preset the points behind/before the actual desired points by the amount of the shift.
- The tape transport buttons on the player and the recorder are operative even while programming or automatic assemble editing is being executed. So, be careful not to touch a button in error, as automatic assemble editing might fail inadvertently.



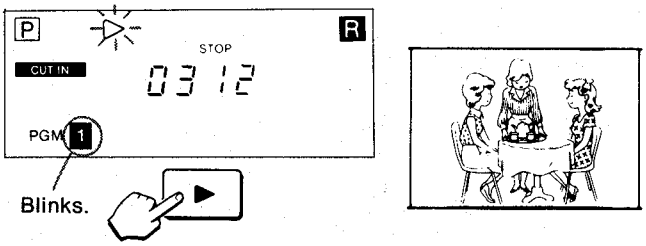
1 Turn on the power of the player and the recorder.



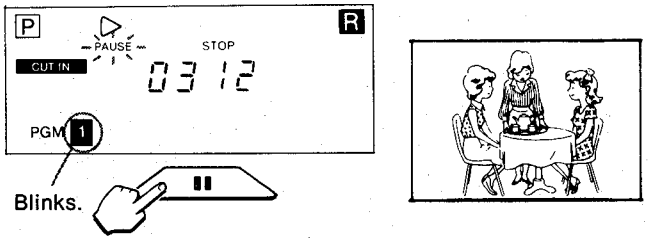
2 Press the PLAYER button.



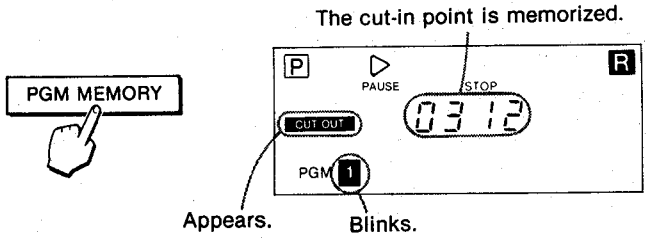
3 Press the ▶ button to play back the original tape and locate the cut-in (starting) point of the scene to be edited first (program 1).
Use the picture search function, etc. if they can be activated on your player.



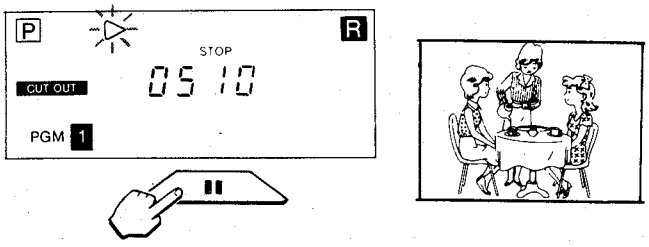
4 At the cut-in point, press the ❚❚ button.



5 Press the PGM MEMORY button.

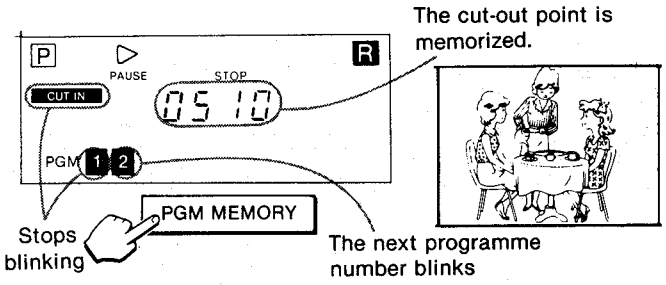


6 Press the ❚❚ button to resume playback and locate the cut-out (end) point of the scene.



7 At the cut-out point, press the ❚❚ button.

8 Press the PGM MEMORY button.

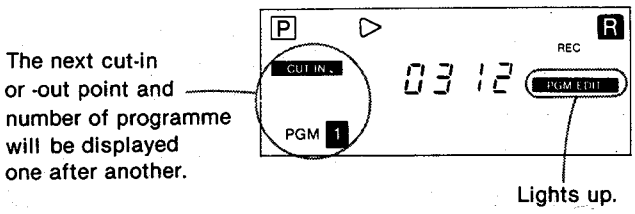


To edit other scenes, resume playback by pressing the ❚❚ button and locate the cut-in point of the next scene, then repeat steps **4** to **8**.
To play back the memorized scenes and check the cut-in and -out points before actual editing, see "PREVIEW" on page 17.

9 Set the recorder to recording pause mode, following the steps of "TO START RECORDING FROM THE RECORDING PAUSE MODE" on page 14.
When the recorder is connected to the CAMERA REMOTE OUT jack, use the tape transport buttons on the recorder.

10 Press the PGM EDIT button.
Automatic assemble editing will begin.
The procedure is as follows:

Player: Playback of programme [1] → Fast forward or rewind → Playback of programme [2] → Fast forward or rewind →.....etc.
Recorder: Recording of programme [1] → Recording pause → Recording of programme [2] → Recording pause → ...



When automatic assemble editing is completed, the player and the recorder will be automatically set to stop mode and the PGM EDIT indicator disappears.

To repeat the same automatic assemble editing
Press the PGM EDIT button again.

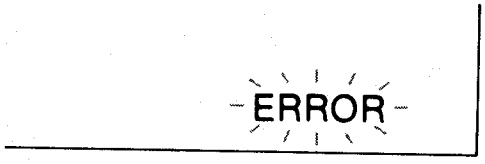
If desired, the cut-in and cut-out points can be preset by pressing the PGM MEMORY button during playback, without pausing the tape as in steps **4** and **7**.

During automatic assemble editing, each scene is played back from a point slightly before the memorized cut-in point (by approximately 5 to 10 digits of the tape counter) and to a point slightly after the memorized cut-out point (by approximately 1 digit of the counter), while it is recorded correctly from the memorized cut-in point to the cut-out point.

To stop the automatic assemble editing
Press the PGM EDIT button again.
The recorder is set to recording pause mode.

Notes
- After presetting the scenes, never press the COUNTER RESET button on this unit or on the player or remove the cassette from the player. Doing so will cause the tape counter to be reset to zero and the cut-in and cut-out points to be shifted.
- During automatic assemble editing, only the AC button (to clear the memorized programs) and the PGM EDIT button (to stop the editing) are operative. The other buttons will not operate.
- A cut-in point should be at least 10 digits of the tape counter after the beginning of the tape, and the cut-out point should be at least 3 digits before the end of the tape. With less space, automatic assemble editing and programme play (page19) may not operate correctly.
- When the cut-in point of a scene is memorized just after the cut-out point of the previous scene, the two scenes will be played back continuously.
- When 8 scenes have been programmed, all [1] to [8] programme numbers will remain lit. However, if the ← PGM or PGM → button is pressed to change or erase the memory of a certain scene, the corresponding programme number will blink.
- The memorized cut-in and cut-out points will be erased when the power of the player is turned off.
- On certain VTRs, automatic assemble editing and previewing may not operate correctly if the cut-out point is memorized within 4 digits of the tape counter after the cut-in point.

When the ERROR indicator blinks

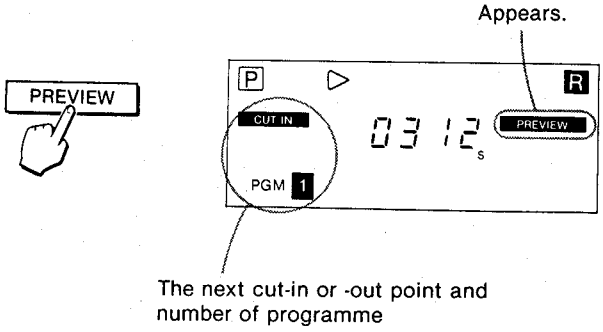


The cut-in point on the tape is behind the cut-out point of the same programme. Enter the points correctly, following "To change the programme" on page 19. If the correction is not made, the scene will be skipped during automatic assemble editing.

1-9. PREVIEW

—To check the programmes before actual editing

Press the PREVIEW button.



Rewind or fast forward to the point slightly before the preset cut-in point
↓
Playback for approximately 5 to 10 digits of the tape counter
↓
Still picture of cut-in point for several seconds
↓
Playback
↓
Still picture of cut-out point for several seconds

The above is repeated consequently for each memorized scene in the programme number order.
After playback of the last scene, the tape will stop automatically.

During playback in between the cut-in and -out points, the picture, can be scanned faster by pressing the ▶▶ button.
In still picture, fast forward or rewind mode, only the AC button is operative. The other buttons will not function.

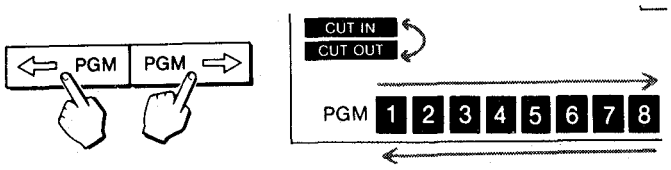
To repeat the same previewing
Press the PREVIEW button again.

To stop the previewing that is in operation
Press the PREVIEW button.

AFTER PROGRAMMING

To check the tape counter of the cut-in and cut-out points

Press the PGM → or ← PGM button.

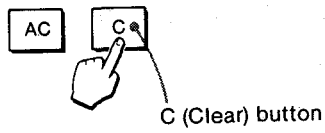


Each time the PGM → button is pressed, the tape counter indicates the cut-in and -out point of programme 1 to programme 8 successively.
When the ← PGM button is pressed, the sequence is reversed.
For the programme number into which nothing is preset "– – – – – is displayed.
The tape counter will automatically return to the counter of the player after several seconds.

To change the program

1 Press the ← PGM or PGM → button until the tape counter of the cut-in or -out point you desire to change is displayed in the display window.
2 Press the PLAYER button, and then the ▶ button to start playback.
3 Re-locate the desired cut-in or -out point to be set, and then at that point, press the ❚❚ button and the PGM MEMORY button.
Repeat steps 1~3 for each point to be changed.

To erase the memory of a certain programme

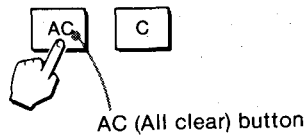


C (Clear) button

1 Press the ← PGM button or the PGM → button until the cut-in point of the programme to be erased is displayed on the tape counter.
2 Press the C button. The counter indicates "– – – – – for several seconds, then returns to the tape counter for the player.
3 Press the PGM → button once to display the cut out point of the programme.
4 Press the C button. The counter indicates "– – – – – for several seconds, then returns to the tape counter for the player.
The programme is now erased from the memory.

For each programme to be erased, repeat the same procedure.

To erase the memory of all the programmes

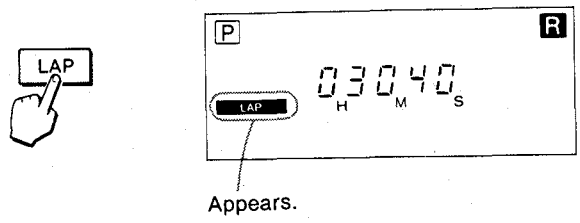


AC (All clear) button

Press the AC button.
The counter indicates "– – – – – for several seconds, then returns to the tape counter for the player. The CUT IN indicator appears and programme number 1 blinks.

To check the total time of all the scenes to be edited

When the player is equipped with a "time" counter (5-digits counter with H, M, S indicators) the approximate total time of all the scenes to be edited will be displayed by pressing the LAP button. This function is useful when you want to know if the tape is long enough for recording.



Appears.

When the player is not equipped with a time counter, the "– – – – – is indicated on the counter.

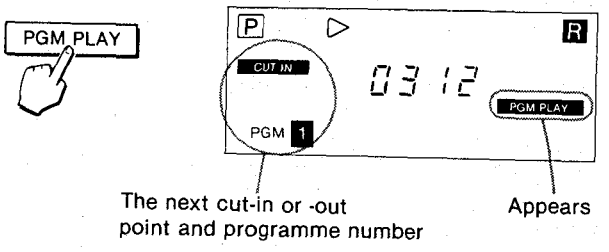
To return to the tape counter for the player, press the LAP button again.

1-10. PROGRAMME PLAY

—To play back the memorized scenes automatically

The memorized scenes can be played back in sequence as BGV (Background Video).

After performing steps **1** to **8** of automatic assemble editing (page 16), press the PGM PLAY button.



The tape will be wound to the point slightly before the memorized cut-in point (by approximately 5 to 10 digits of the tape counter) and playback begins. When the tape reaches the cut-out point, the player automatically goes into fast forward or rewind mode to locate the next scene. For each memorized scene, the same procedure is repeated. After playback of the last scene is completed, the tape stops.
To repeat programme play, press the PGM PLAY button again.

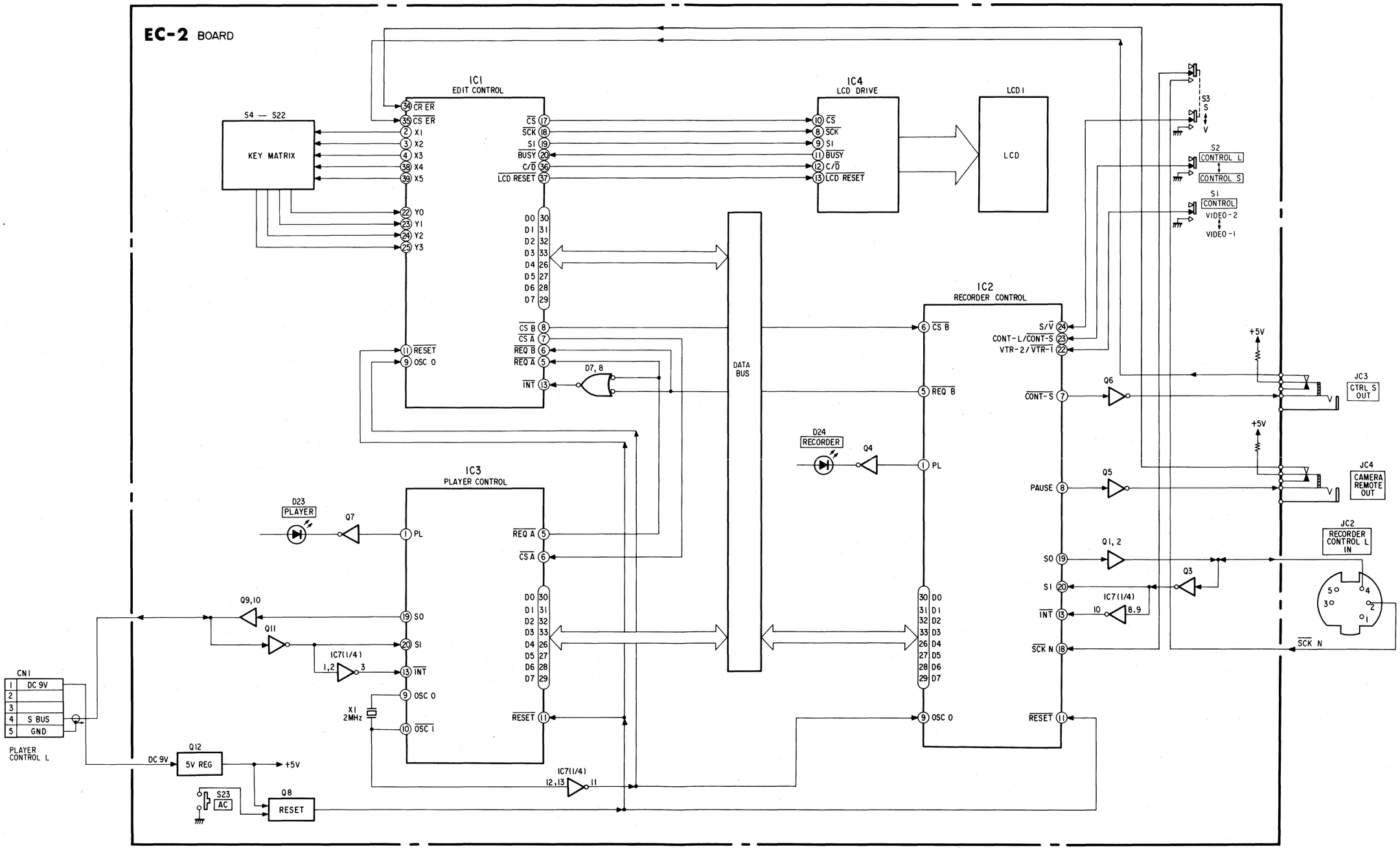
1-11. TROUBLE CHECKS

If any difficulty should arise during operation, first check the player connection, then go through the following list. Should the difficulty persist, unplug the unit and contact your Sony dealer or local authorized Sony service facility.

Symptom	Possible causes
The ERROR indicator blinks when the player is turned on.	● Incorrect recorder connection. ● Incorrect CTRL L/CTRL selector setting. ● Two VTRs are connected on the recorder's side.
The recorder and/or the player does not operate when the VIDEO EDIT, tape transport or RECORDER REC button is pressed.	● The power of the recorder or the player is turned off. ● Incorrect VTR-1/VTR-2 selector setting. ● Incorrect VTR select button setting. ● The recorder connected to the CAMERA REMOTE OUT jack cannot be activated with these buttons. ● The player cannot be activated with the RECORDER REC button. ● No cassette is loaded in the recorder. ● The cassette safety tab has been removed or slid to prevent erasure of recording.
Recording does not begin even if the PGM EDIT button is pressed for automatic assemble editing.	● The tape for recording is wound to the end. ● The cassette safety tab has been removed or slid to prevent erasure of recording.
Automatic assemble editing cannot be made correctly.	● The COUNTER RESET button on this unit or on the player was pressed during editing. ● The power of the player or the recorder was turned off or the cassette was removed. ● The cut-in and -out points are preset incorrectly. ● The ERROR indication was blinking during programming. ● The cassette safety tab has been removed or slid to prevent erasure of recording.
The tape counter does not indicate the counter of the player.	● The LAP button has been pressed. Press the LAP button again.

SECTION 2
DIAGRAM

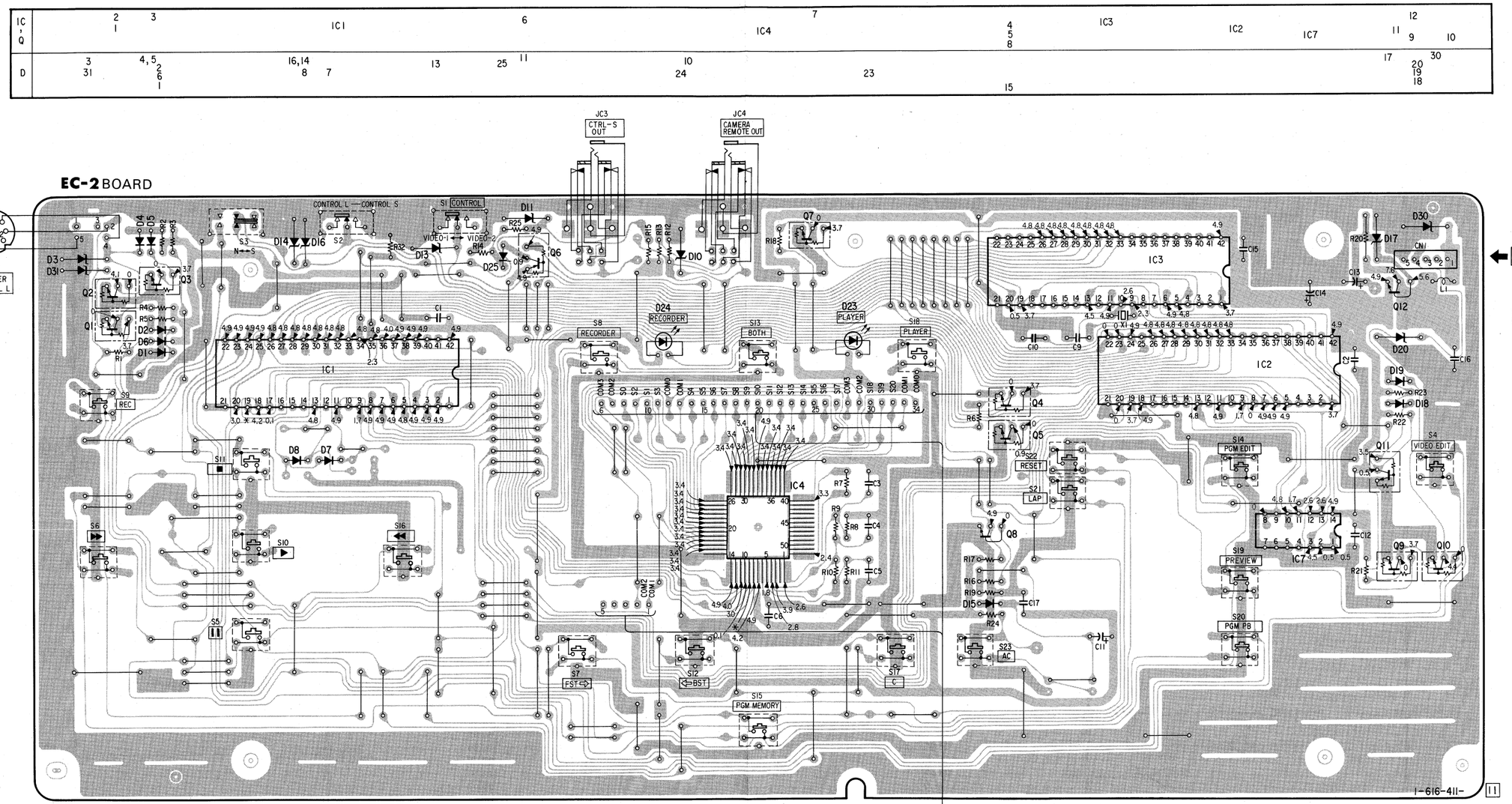
2-1. BLOCK DIAGRAM

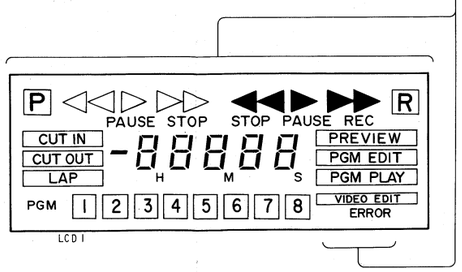


SECTION 3
SCHEMATIC DIAGRAM AND PRINTED WIRING BOARD

3-1. PRINTED WIRING BOARD EC-2 (EDITING CONTROL, PB/REC CONTROL) PRINTED WIRING BOARD

— Solder Side —

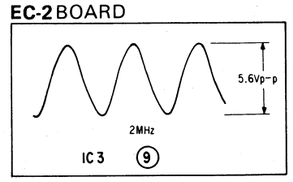


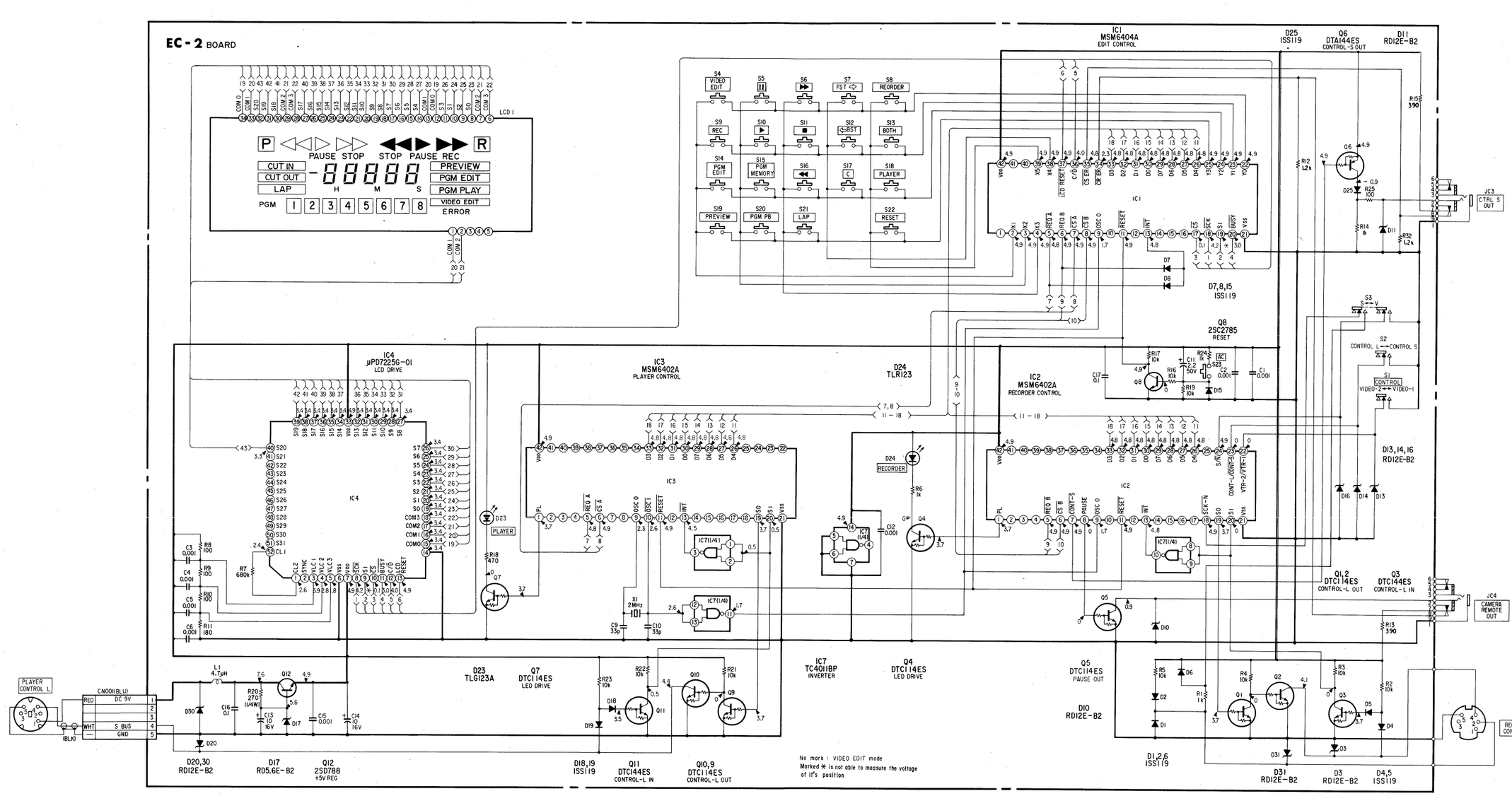


- ○— : indicates a lead wire mounted on the component side.
- ▒ : soldering side
- ▒ : B+ pattern

no mark : VIDEO EDIT mode
Marked ✱ is not able to measure the voltage of it's position

EC-2 BOARD

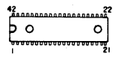




- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- ▭ : panel designation.
- ——— : B+ bus.
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

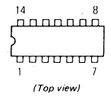
3-3. SEMICONDUCTORS

MSM6402A-80RS
MSM6404A-81RS



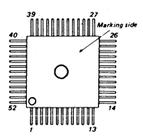
(Top view)

TC4011BP



(Top view)

μPD7225G-01



2SC1474
2SD788

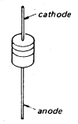
EQA02-11C
HZ5.6E-B2
HZ12E-B2
RD5.6E-B2
RD12E-B2

2SC1740

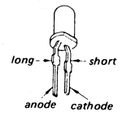
2SC2458
2SC2603
2SC2785
DTA144ES
DTC114ES
DTC144ES

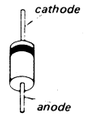
2SD733

1SS119
1SS133
1SS148



TLG123A
TLR123



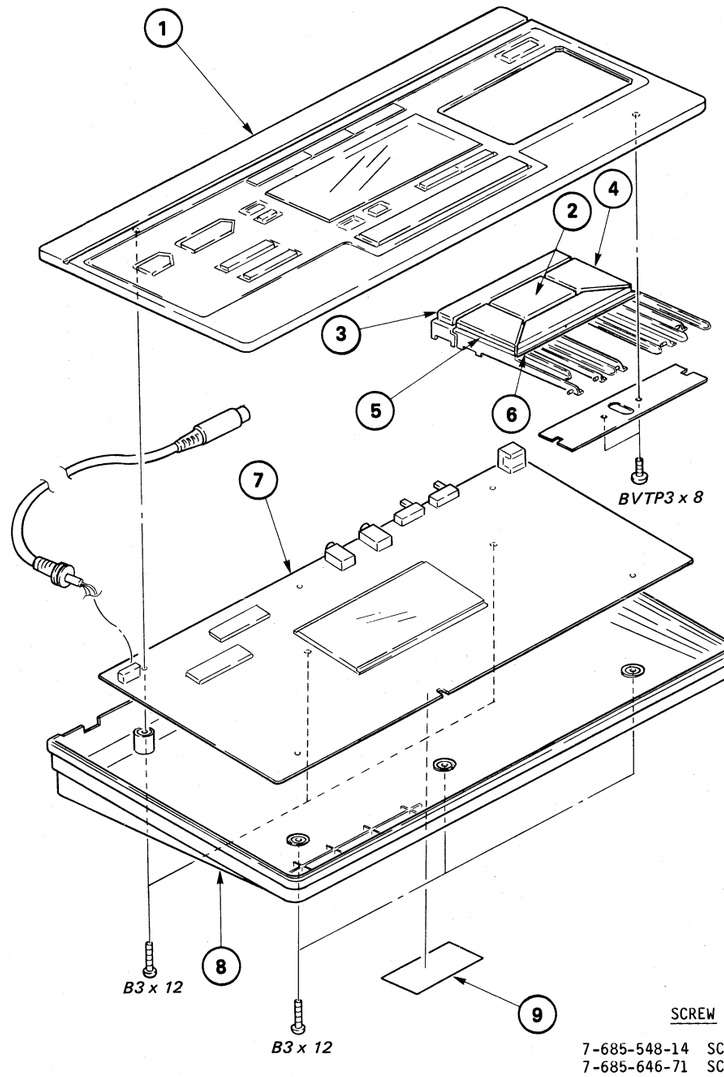


SECTION 4
EXPLODED VIEW

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



SCREW

7-685-548-14	SCREW +BTP	3X12 TYPE2 N-S
7-685-646-71	SCREW +BVTP	3X8 TYPE2 N-S

No.	Part No.	Description	Remark
1	X-2355-204-1	PANEL SUB ASSY	
2	2-355-212-01	KEY TOP (PB)	
3	2-355-213-01	KEY TOP (STP)	
4	2-355-214-01	KEY TOP (FF)	
5	2-355-215-01	KEY TOP (RW)	
6	2-355-216-01	KEY TOP (POUSE)	
7	*1-616-411-11	EC-2 BOARD	
8	*2-355-221-21	LID, BOTTOM	
9	*2-355-231-01	LABEL, MODEL NUMBER	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No	Part No.	Description			Remark
	*1-616-411-11	EC-2 BOARD **********			
	1-558-020-11	CORD, CONNECTION			
	*3-662-205-00	HOLDER (E), LED			
		CAPACITOR			
C001	1-101-001-00	CERAMIC	0.001MF	50V	
C002	1-101-001-00	CERAMIC	0.001MF	50V	
C003	1-101-001-00	CERAMIC	0.001MF	50V	
C004	1-101-001-00	CERAMIC	0.001MF	50V	
C005	1-101-001-00	CERAMIC	0.001MF	50V	
C006	1-101-001-00	CERAMIC	0.001MF	50V	
C009	1-102-963-00	CERAMIC	33PF 5%	50V	
C010	1-102-963-00	CERAMIC	33PF 5%	50V	
C011	1-123-381-00	ELECT	2.2MF 20%	50V	
C012	1-101-001-00	CERAMIC	0.001MF	50V	
C013	1-123-356-00	ELECT	10MF 20%	16V	
C014	1-123-356-00	ELECT	10MF 20%	16V	
C015	1-101-001-00	CERAMIC	0.001MF	50V	
C016	1-161-063-00	CERAMIC	0.1MF 20%	25V	
C017	1-161-063-00	CERAMIC	0.1MF 20%	25V	
		DIODE			
D001	8-719-911-19	DIODE 1SS119			
D002	8-719-911-19	DIODE 1SS119			
D003	8-719-100-65	DIODE RD12E-B2			
D004	8-719-911-19	DIODE 1SS119			
D005	8-719-911-19	DIODE 1SS119			
D006	8-719-911-19	DIODE 1SS119			
D007	8-719-911-19	DIODE 1SS119			
D008	8-719-911-19	DIODE 1SS119			
D010	8-719-100-65	DIODE RD12E-B2			
D011	8-719-100-65	DIODE RD12E-B2			
D013	8-719-100-65	DIODE RD12E-B2			
D014	8-719-100-65	DIODE RD12E-B2			
D015	8-719-911-19	DIODE 1SS119			
D016	8-719-100-65	DIODE RD12E-B2			
D017	8-719-100-35	DIODE RD5.6E-B2			
D018	8-719-911-19	DIODE 1SS119			
D019	8-719-911-19	DIODE 1SS119			
D020	8-719-100-65	DIODE RD12E-B2			
D023	8-719-812-33	DIODE TLG123A			
D024	8-719-812-31	DIODE TLR123			
D025	8-719-911-19	DIODE 1SS119			
D030	8-719-100-65	DIODE RD12E-B2			
D031	8-719-100-65	DIODE RD12E-B2			
		IC			
IC001	8-759-922-57	IC MSM6404A-80RS			
IC002	8-759-922-58	IC MSM6402A-81RS			
IC003	8-759-922-58	IC MSM6402A-81RS			
IC004	8-759-103-72	IC UPD7225G-01			
IC007	8-759-240-11	IC TC4011BP			

Ref.No	Part No.	Description			Remark
		JACK			
JC002	1-562-732-11	SOCKET 5P			
JC003	1-507-806-41	JACK			
JC004	1-507-806-41	JACK			
		COIL			
L001	1-408-599-00	MICRO INDUCTOR 4.7UH			
		L.C.D			
LCD001	1-807-226-11	DISPLAY PANEL, LIQUID CRYSTAL			
		TRANSISTOR			
Q001	8-729-900-80	TRANSISTOR DTC114ES			
Q002	8-729-900-80	TRANSISTOR DTC114ES			
Q003	8-729-900-89	TRANSISTOR DTC144ES			
Q004	8-729-900-80	TRANSISTOR DTC114ES			
Q005	8-729-900-80	TRANSISTOR DTC114ES			
Q006	8-729-900-65	TRANSISTOR DTA144ES			
Q007	8-729-900-80	TRANSISTOR DTC114ES			
Q008	8-729-245-83	TRANSISTOR 2SC2458			
Q009	8-729-900-80	TRANSISTOR DTC114ES			
Q010	8-729-900-80	TRANSISTOR DTC114ES			
Q011	8-729-900-89	TRANSISTOR DTC144ES			
Q012	8-729-177-32	TRANSISTOR 2SD773			
		RESISTOR			
R001	1-247-831-00	CARBON	1K 5%	1/6W	
R002	1-247-855-00	CARBON	10K 5%	1/6W	
R003	1-247-855-00	CARBON	10K 5%	1/6W	
R004	1-247-855-00	CARBON	10K 5%	1/6W	
R005	1-247-855-00	CARBON	10K 5%	1/6W	
R006	1-247-831-00	CARBON	1K 5%	1/6W	
R007	1-247-899-00	CARBON	680K 5%	1/6W	
R008	1-247-807-00	CARBON	100 5%	1/6W	
R009	1-247-807-00	CARBON	100 5%	1/6W	
R010	1-247-807-00	CARBON	100 5%	1/6W	
R011	1-247-813-00	CARBON	180 5%	1/6W	
R012	1-247-833-00	CARBON	1.2K 5%	1/6W	
R013	1-247-821-00	CARBON	390 5%	1/6W	
R014	1-247-831-00	CARBON	1K 5%	1/6W	
R015	1-247-821-00	CARBON	390 5%	1/6W	
R016	1-247-855-00	CARBON	10K 5%	1/6W	
R017	1-247-855-00	CARBON	10K 5%	1/6W	
R018	1-247-823-00	CARBON	470 5%	1/6W	
R019	1-247-855-00	CARBON	10K 5%	1/6W	
R020	1-247-117-00	CARBON	270 5%	1/4W	
R021	1-247-855-00	CARBON	10K 5%	1/6W	
R022	1-247-855-00	CARBON	10K 5%	1/6W	
R023	1-247-855-00	CARBON	10K 5%	1/6W	
R024	1-247-831-00	CARBON	1k 5%	1/6W	
R025	1-247-807-00	CARBON	100 5%	1/6W	

EC-2

Ref.No	Part No.	Description	Remark
R032	1-247-833-00	CARBON 1.2K 5% 1/6W	
		SWITCH	
S001	1-553-725-21	SWITCH, SLIDE	
S002	1-553-725-21	SWITCH, SLIDE	
S003	1-553-716-00	SWITCH, SLIDE	
S004	1-554-174-00	SWITCH, KEY BOARD	
S005	1-554-174-00	SWITCH, KEY BOARD	
S006	1-554-174-00	SWITCH, KEY BOARD	
S007	1-554-174-00	SWITCH, KEY BOARD	
S008	1-554-174-00	SWITCH, KEY BOARD	
S009	1-554-174-00	SWITCH, KEY BOARD	
S010	1-554-174-00	SWITCH, KEY BOARD	
S011	1-554-174-00	SWITCH, KEY BOARD	
S012	1-554-174-00	SWITCH, KEY BOARD	
S013	1-554-174-00	SWITCH, KEY BOARD	
S014	1-554-174-00	SWITCH, KEY BOARD	
S015	1-554-174-00	SWITCH, KEY BOARD	
S016	1-554-174-00	SWITCH, KEY BOARD	
S017	1-554-174-00	SWITCH, KEY BOARD	
S018	1-554-174-00	SWITCH, KEY BOARD	
S019	1-554-174-00	SWITCH, KEY BOARD	
S020	1-554-174-00	SWITCH, KEY BOARD	
S021	1-554-174-00	SWITCH, KEY BOARD	
S022	1-554-174-00	SWITCH, KEY BOARD	
S023	1-554-174-00	SWITCH, KEY BOARD	
		CRYSTAL	
X001	1-567-254-11	OSCILLATOR, CERAMIC (2MHZ)	

****

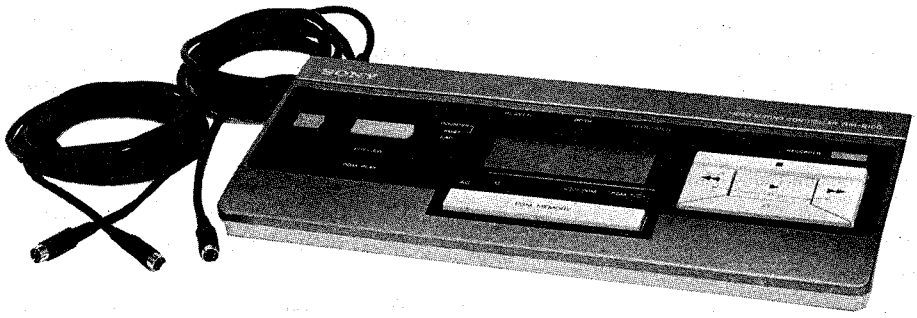
ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
1-506-521-11	PLUG ADPTOR	
1-558-019-11	CORD, CONNECTION	
1-558-025-11	CABLE, CONNECTION	
*2-355-223-21	INDIVIDUAL CARTON	
*2-355-226-01	CUSHION	
3-760-384-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH/GERMAN/DUTCH)	
3-760-384-41	MANUAL, INSTRUCTION (SPANISH/SWEDISH/ITARIAN)	

RM-E100V

OPERATION MANUAL

AEP Model
UK Model



November, 1985

MICROFILM

VIDEO EDITING CONTROLLER

SONY®

ACC

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1. GENERAL

The RM-E100V is an editing controller used in combination with a VTR unit which has CONTROL-L terminals such as CCD-V8E and SL-HF950ES/E as a replay VTR unit.
A VTR unit with terminals such as CONTROL-L and CONTROL-S, or CAMERA REMOTE terminals can be used as a recording VTR unit.

Fig. 1-1 shows the system diagram of the editing controller. The editing controller and replay VTR (player) has CONTROL-L communications. Data such as VTR operation mode and counter values is sent from the replay VTR to the editing controller, and commands to the VTR flow from the editing controller to the replay VTR. The editing controller controls the recording VTR by CONTROL-L and -S communications or by CAMERA REMOTE signals, etc.

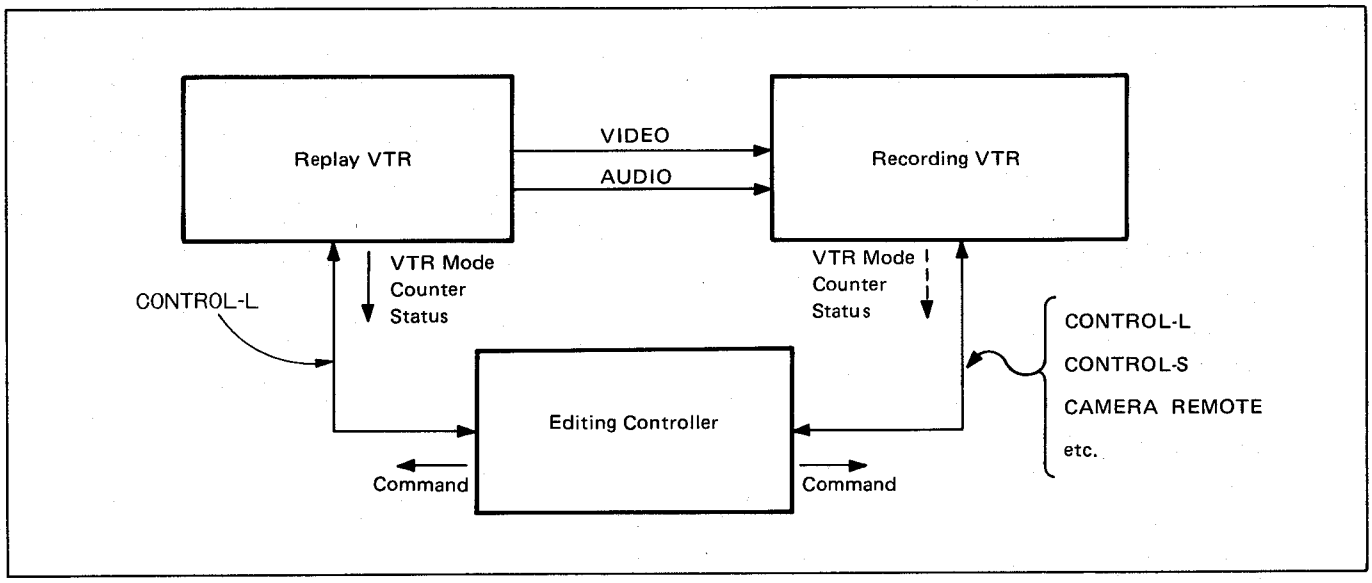


Fig. 1-1

2. DESCRIPTIONS OF FUNCTIONS

2-1. CONNECTION

Only a VTR model that accepts CONTROL-L communications can be used as a replay VTR (player). Power to this controller is fed by the replay VTR. A VTR model which accepts one of the following four communication systems can be used as a recording VTR (recorder):

1. CONTROL-L
2. CONTROL-S (including SONY infrared remote control)
3. CAMERA REMOTE (including CAMERA REMOTE of Matsushita Electric Industrial Co., Ltd. and Victor Compary of Japan, Ltd.)
4. MITSUBISHI code infrared remote control (for CCIR Betamax)

An infrared transmitter (RMT-E1S) available as an option is needed for use with an infrared remote control unit. The communication system with the recorder VTR will be set using switches at Pins ㉒ , ㉓ , and ㉔ of IC2 (MSM6402A) as shown in Table 2-1. The CONTROL-S guide code will not be used if the camera remote terminal is used.

1 ..... OPEN
0 ..... GND

Communication System	Guide Code	Pin ㉒ (VTR-2/VTR-1)	Pin ㉓ (CONTROL-L/CONTROL)	Pin ㉔ (S/V)
CONTROL-L	——		1	1
CONTROL-S or SONY infrared remote control	VTR-1 or VTR-2	1 or 0	0	1
SONY CAMERA REMOTE	——		0	1
MATSUSHITA CAMERA REMOTE CONTROL	——	1	0	0
VICTOR COMPANY OF JAPAN Pause Remote Control/Remote Pause	——	0	0	0
MITSUBISHI Code	——		0	0

Table 2-1

2-2. REMOTE CONTROL FUNCTION

- The VTR unit can be remote controlled in the following three modes:
  PLAYER mode. . . . . .The replay VTR only is remote controlled.
  RECORDER mode . . . . .The recorder VTR only is remote controlled.
  BOTH mode. . . . . .The VTRs on both recording and replay sides are remote controlled simultaneously.
- The following keys can be operated in the remote control function:
  PB, FF, REWIND, PAUSE, STOP, REC (only with the recorder), COUNTER RESET (some VTRs do not accept COUNTER RESET)
- Only the PAUSE key works on the recording VTR if the CAMERA REMOTE terminal is connected to the recording VTR.
- The REC command, which works only with the recorder, is not output to the replay VTR to prevent erasing by mistake.
- The remote control function does not work during the execution of a special command (PROGRAM EDIT, PREVIEW, PROGRAM PLAY, or VIDEO EDIT). The PLAYER mode will be set after a special command is executed.

2-3. PROGRAMMING FUNCTION

- Up to eight sets (eight programs) can be memorized using a CUT IN counter value and CUT OUT counter value as one set (one program).
- In the initial status, the controller stands by for input of CUT IN of PGM1 (PROGRAM 1). Press the [PGM MEMORY] key to memorize the counter value of this editing point as "PGM1-CUT IN" after operating the replay VTR by remote control and after finding the editing point.
  Memorizing is possible sequentially by repeating this process as follows:
  PGM1 CUT IN → PGM1 CUT OUT →PGM2 CUT IN →PGM2 CUT OUT → PGM3 CUT IN . . . . . →PGM8 CUT OUT
- The PGM No. will be displayed after both CUT IN and CUT OUT are memorized.
- The PGM No. standing by for input will flash. The controller is standing by for input of PGM3 CUT OUT if PGM No. 3 is flashing and "CUT OUT" is displayed.
- Press the [PGM⇨] (FORWARD STEP) key or [⇦PGM] (BACK STEP) key to advance PGM or to see the content of the PGM input before.
  Press the [PGM⇨] key or [⇦PGM] key to flash the PGM No. and display "CUT IN" or "CUT OUT". The counter value at the editing point will be displayed simultaneously with this for four seconds allowing the memorized content to be confirmed. "- - - -" or "-H-M-S" will be displayed if no input is made.

1) Program change

- Project the desired scene by designating the editing point desired to be changed (PGM No. and CUT IN or CUT OUT) operating the [PGM⇨] key or the [⇦PGM] key and by remotely operating the replay VTR. By pressing the [PGM MEMORY] key, the counter value of this scene will be memorized and the old counter value will be erase.
- Designate the editing point desired to be erased by operating the [PGM⇨] key or [⇦PGM] key and press the [C] (CLEAR) key to erase the memory content on theat editing point.
- Press the [AC] (ALL CLEAR) key to erase all the memory contents.

2) Input error

- An input error results if (CUT IN counter value) K (CUT OUT counter value) with CUT IN and CUT OUT of the same PGM No. The ERROR display will flash and the counter value will not be memorized even if the [PGM MEMORY] key is pressed.
  (The previous counter value remains if an error is made in a program change.)
- The ERROR display will be erased when a correct counter value is reinput or when the [PGM⇨] key or [⇦PGM] key is operated.

3) Integrated time display

- The integrated time from PGM1 to PGM8 will be displayed by pressing the [LAP] key if the replay VTR has an hour-minute-second counter.
  "- - -" will be displayed if the replay VTR has a decimal counter. Repress the [LAP] key to reset to the previous counter value.

2-4. PROGRAM EDIT FUNCTION

- Set the recording VTR to the REC·PAUSE mode after finishing programming of the editing points. Automatic sequential editing will follow in the PGM No. order by pressing the [PGM EDIT] key thereafter.

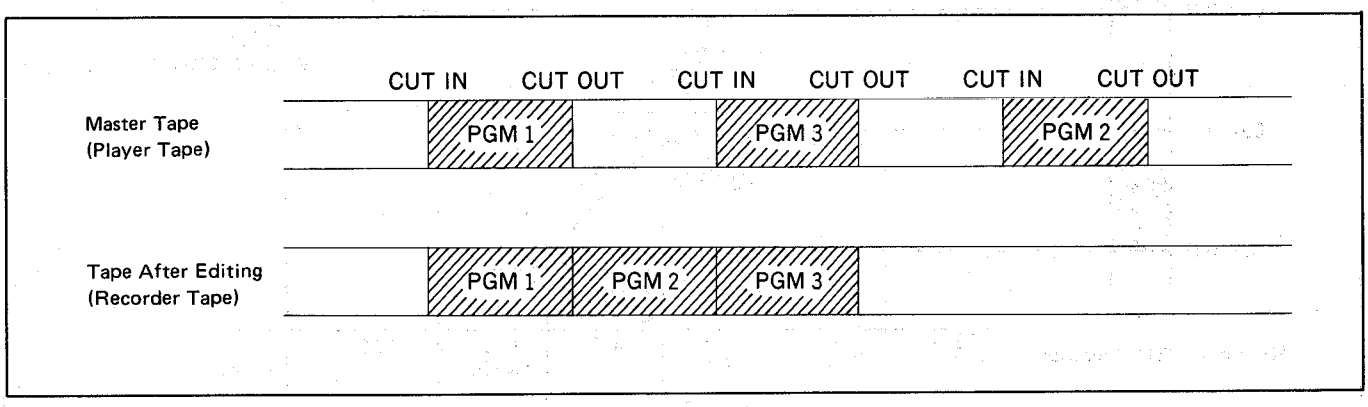


Fig. 2-1

- Only the [PGM EDIT] and [AC] keys work during PGM EDIT.
  By pressing the [PGM EDIT] key, PGM EDIT operation will stop and the replay and recording VTRs will be set to the stop and REC·PAUSE modes.

1) VTR operation during PROGRAM EDIT

Fig. 2-2 shows VTR operation during PROGRAM EDIT with input up to PGM3. The replay VTR should be in the RUN mode between CUT IN and CUT OUT and the recording VTR, in the REC mode during this time to edit. A mode change with the programmed counter value will not be possible if the replay VTR rapidly changes from the FF or REWIND mode to the RUN mode at the CUT IN point. For this, the FF or REWIND mode is temporarily changed to the CUE mode to reduce the tape speed before the RUN mode is set up.

(SLOW DOWN block) The mode changes from CUE to RUN 7 to 14 counts before the CUT IN point to reach the CUT IN point when running of the tape in the replay VTR stabilizes. (The PREROLL block) A PAUSE relase signal is output to the recording VTR the moment the recording VTR reaches the CUT IN point.

At the CUT OUT point, a PAUSE signal will be output to the recording VTR the moment the replay VTR reaches the CUT OUT point. If replaying of the replay VTR is stopped simultaneously this time, a blank is produced on the recording tape due to a very slight timing slip, and a STOP signal will be output to the replay VTR after replaying one count ahead from the CUT OUT point.

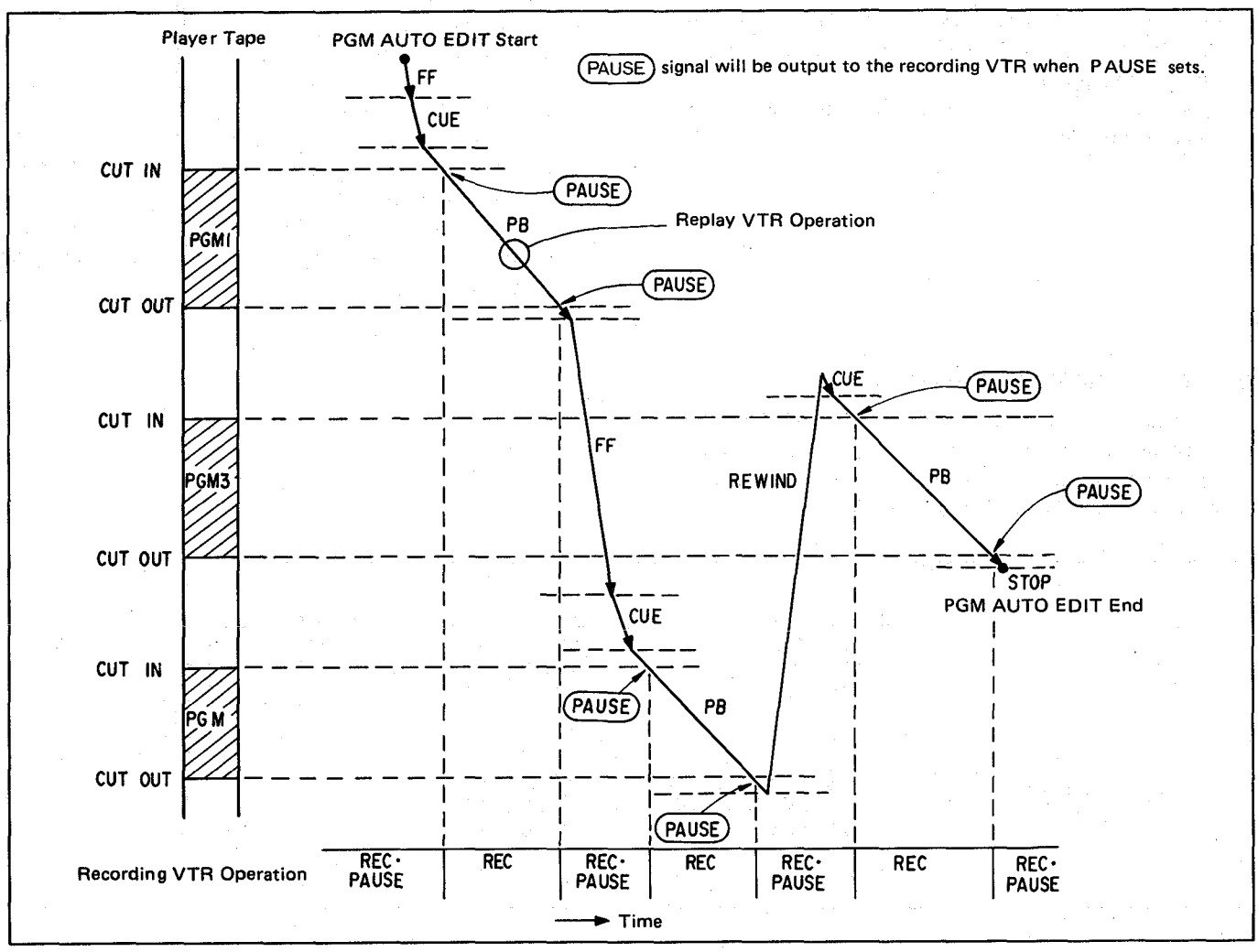


Fig. 2-2 VTR Operation During PROGRAM EDIT

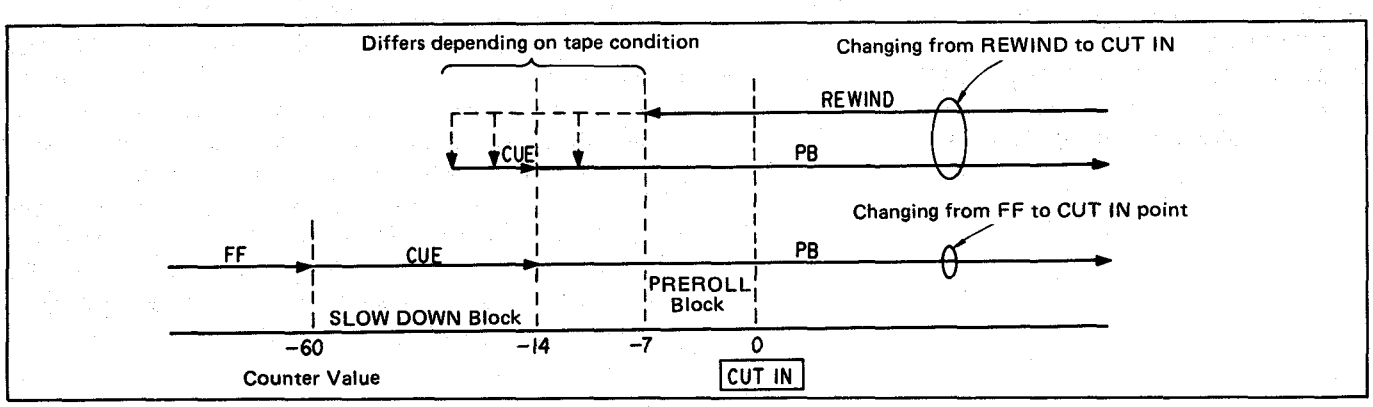
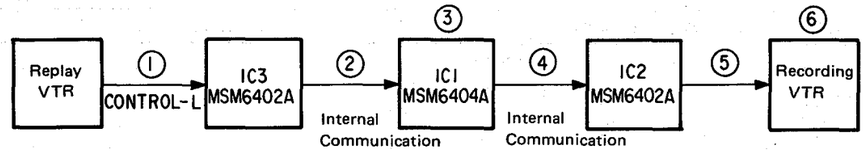


Fig. 2-3 Advancing to CUT IN Point

2) Command transmission delay time at editing point

The moment the replay tape reaches the editing point during PROGRAM AUTO EDIT, the rrcording VTR receives a command signal from the editing controller. However, it takes time until the mode change is completed thereafter. This time remains on the recording tape as an editing point slip. In addition to this, editing point slips are also caused by the replay VTR counter accuracy, one-count time width, and other causes. The editing accuracy of this editing controller is ±1 sec on a target editing point. The command signal delay time (maximum value) within the range that does not depend on a VTR is shown below. The time needed for a mode change of the recording VTR is added to the actual delay time.



Unit: (msec)

Communication Method with Recording VTR	① Replay VTR→ IC3	② IC3→ IC1	③ Inside IC1	④ IC1→ IC2	⑤ IC2→Recording VTR	⑥ Recording VTR Receiving Time	Total
CONTROL-L	20	0.5	20	20+3	20	20×4	163.5
CONTROL-S	20	0.5	20	45+3	45	45×2	223.5
CAMERA REMOTE	20	0.5	20	45+3	45	Depends on VTR	

Fig. 2-4

2-5. PREVIEW FUNCTION

- This function is used to check editing points before performing PROGRAM AUTO EDIT.
- By pressing the [PREVIEW] key, only the replay VTR works.
  The replay VTR functions nearly the same as during PROGRAM AUTO EDIT with the exception of the following:
  1. The STILL mode is set approximately 1.5 sec on editing points (CUT IN and CUT OUT points).
  2. By pressing the [▷▷] (FF) key during replay between CUT IN and CUT OUT, the tape can be fed in the CUE mode. This enables checking of editing points in a short time. The PB mode is forcibly set up eight counts before the CUT OUT point enabling checking of the CUT OUT point.
- Press the [PREVIEW] key to stop PREVIEW operation. The replay VTR stops.
- Only the [PREVIEW], [▷▷], and [AC] keys work during PREVIEW operation.

2-6. PROGRAM PLAY FUNCTION

- Only the replay VTR operates by programming the scenes desired to view and by pressing the [PGM PLAY] key. The replay VTR operates nearly the same as during PROGRAM EDIT.
- Press the [PGM PLAY] key to stop the replay VTR when stopping PROGRAM PLAY operation.
- Only the [PGM PLAY] and [AC] keys work during PROGRAM PLAY operation.

2-7. VIDEO EDIT FUNCTION

- Operate the replay VTR and CUE the portion of the replay tape desired to be recorded, on the recording tape. Operate the recording VTR and CUE the recording tape. (Both VTRs are in a STOP condition.) By pressing the [VIDEO EDIT] key, the replay and recording VTRs will be set to the PB and REC modes to perform VIDEO EDIT operation.
- Press the [VIDEO EDIT] key to stop VIDEO EDIT operation. Both replay and recording VTRs stop.
- Only the [VIDEO EDIT] and [AC] keys work during VIDEO EDIT operation.
- A STOP signal will be sent to the recording VTR and VIDEO EDIT operation will end if the replay VTR no longer remains in the PB mode due to a tape end stop or other reason.
- VIDEO EDIT operation does not work if the CAMERA REMOTE terminal is connected.

2-8. LIQUID CRYSTAL DISPLAY FUNCTION

This display also displays the program setting status (CUT IN/CUT OUT ERROR) in addition to displaying the replay VTR operation mode and counter value. The recording VTR operation mode is also displayed if the recording VTR is connected to the CONTROL-L terminal.

2-9. COUNTER FUNCTION

The counter displays in decimal four digits if the replay VTR is a decimal-4 digit counter. Hours, minutes, and seconds will be displayed with the hour-minute-second counter.

For edit processing, an hour-minute-second counter value is converted into a devimal counter value inside IC1 (MSM-6404A).

3. EDITING CONTROLLER CONFIGURATION

The editing controller mainly consists of three microprocessors. (See Fig. 3-1.) MSM6404A containing a 4-Kbyte ROM on the chip performs the main functions of the editing controller. MSM6402A containing a 2-Kbyte ROM is responsible for communications with the replay and recording VTRs and transmits the VTR operation modes (operation conditions) to MSM6404A and commands of MSM6404A to the VTRs. Therefore, MSM6402A plays an interface role between MSM6404A and the VTRs.

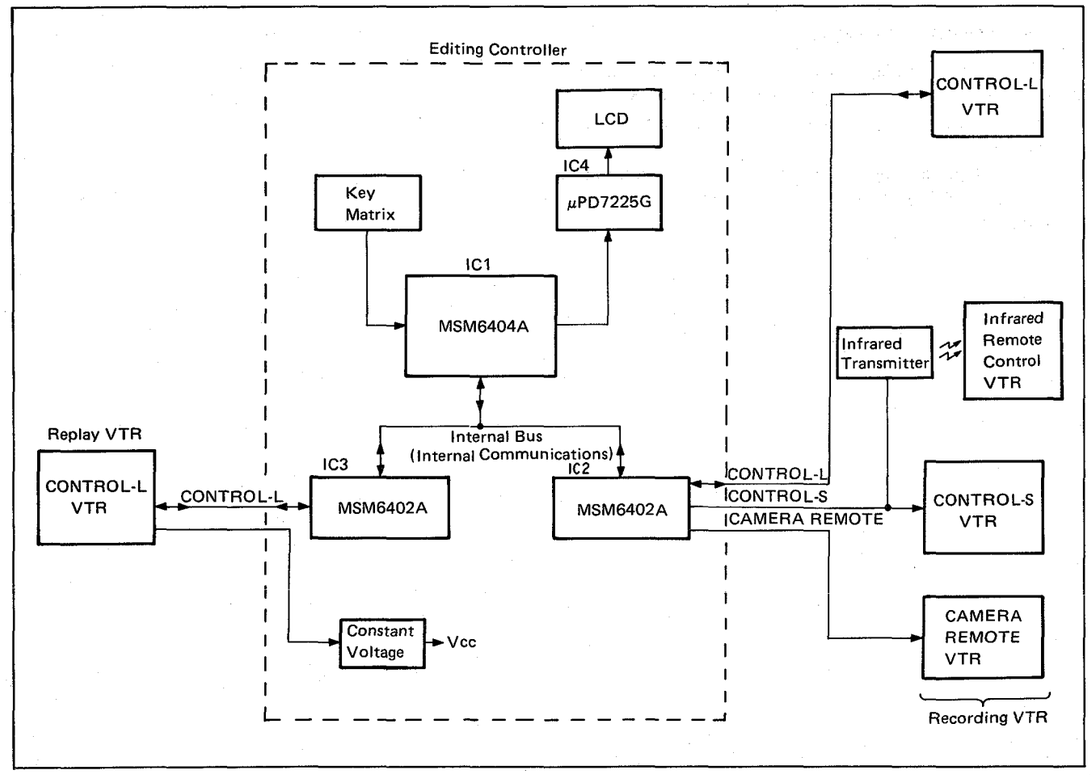


Fig. 3-1 System Block Diagram

4. EDITING CONTROLLER MICROPROCESSER (IC1: MSM6404A)

4-1. SPECIFICATION

MSM6404A is a CMOS 4-bit microprocessor of the following specification:

- 4K × 8 bit On-chip mask ROM contained.
- 256 × 4 bits On-chip RAM contained (including stack region)
- Command execution time 2μsec (clock is 2MHz)
- 5V single power supply
- 42 pin DIP package

4-2. PIN FUNCTIONS

Pin No.	Port Name	IN/OUT	Signal Name	Function
1	P40			Not used
2	P41	O	X1	Key scan output
3	P42	O	X2	
4	P43	O	X3	
5	P30	I	$\overline{\text{REQ A}}$	Internal communication request signal from replay-side MSM6402A (IC3)
6	P31	I	$\overline{\text{REQ B}}$	Internal communication request signal from recording-side MSM6402A (IC2)
7	P32	O	$\overline{\text{CS A}}$	Chip select signal for internal communications (replay side) (IC3A)
8	P33	O	$\overline{\text{CS B}}$	Chip select signal for internal communications (recording side) (IC2A)
9	OSC 0	I	OSC 0	Clock oscillating element connection pin (input)
10	$\overline{\text{OSC 1}}$	O	$\overline{\text{OSC 1}}$	Clock oscillating element connection pin (output)
11	$\overline{\text{RESET}}$	I	$\overline{\text{RESET}}$	Reset input
12				Not used
13	P20	I	$\overline{\text{INT}}$	Internal communication interupt input with MSM6402A
14	P21			Not used
15	P22			
16	P23			
17	P00	O	$\overline{\text{CS}}$	Display data transmission chip select signal output
18	P01	O	$\overline{\text{SCK}}$	Display data transmission serial clock signal output
19	P02	O	SI	Display data transmission serial data signal output
20	P03	I	$\overline{\text{BUSY}}$	Display transmission BUSY signal input
21	V_{SS}		V_{SS}	Ground pin
22	P10	I	Y0	Key scan input
23	P11	I	Y1	
24	P12	I	Y2	
25	P13	I	Y3	
26	P80	I/O	D4	Internal communication data input/output with MSM6402A
27	P81	I/O	D5	
28	P82	I/O	D6	
29	P83	I/O	D7	
30	P70	I/O	D0	
31	P71	I/O	D1	
32	P72	I/O	D2	
33	P73	I/O	D3	
34	P60	I	$\overline{\text{CR ER}}$	CAMERA REMOTE pin connection detection
35	P61	I	$\overline{\text{CS ER}}$	CONTROL-S pin connection detection
36	P62	O	$\overline{\text{C/D}}$	Display control/data selection output
37	P63	O		μPD7225G reset output
38	P50	O	X4	Key scan output
39	P51	O	X5	
40	P52			Not used
41	P53			
42	V_{DD}		V_{DD}	Power Supply

Table 4-1

4-3. OPERATION

MSM6404A roughly has three functions as follows:

1. Internal communications
   Provides internal communications with MSM6402A to know the VTR status and counter values, based on which the VTRs are controlled.
2. Display
   Displays the VTR operation modes, counter values, program set status, etc. on the LCD.
3. Key input
   Detects the pressed button of the 5 × 4 key matrix and processes accordingly.

1) Internal communications with MSM6402A

MSM6404A (IC1) provides internal communications after receiving communication request signals (REQ A or REQ B) from MSM6402A (IC2, IC3). The communication period differs depending on the communication method between MSM6402A and the VTRs as follows. Therefore, the communication period with IC3 is a V period and that with IC2, V period 45 msec.

Communication Method with VTRs	Period
CONTROL-L	VTR V period (vertical period)
CONTROL-S	45 msec
CAMERA REMOTE	45 msec

Table 4-2

Fig. 4-1 shows timing of internal communications. Chip selector signals ($\overline{CS\ A}$ and $\overline{CS\ B}$) are output by MSM6404A to select the communication partner (IC2 or IC3).

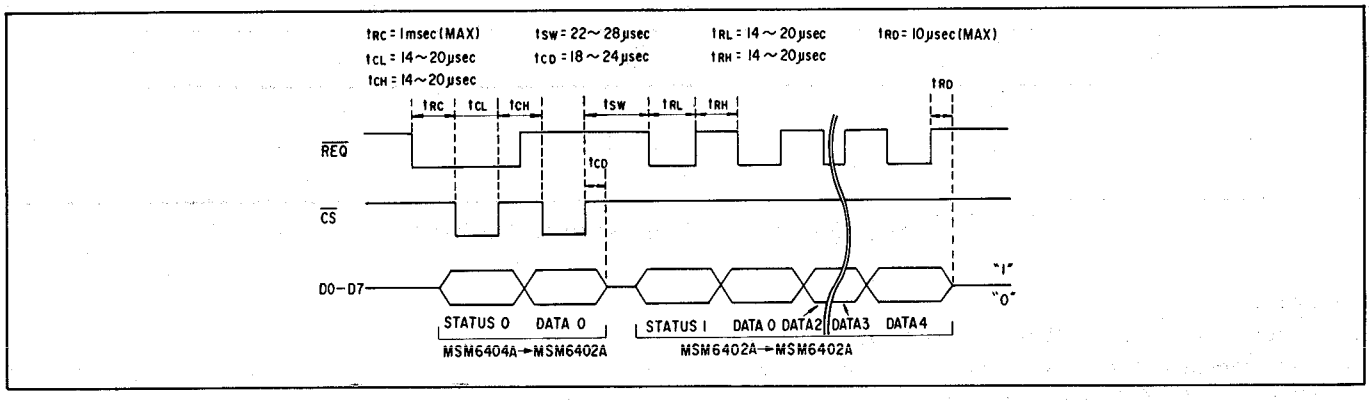


Fig. 4-1 Internal Communication Timing Chart

STATUS 9 and DATA 0 are data sent from MSM6404A to MSM6402A. Conversely, STATUS 1 and DATA 1 to 4 are data sent from MSM6402A to MSM6404A. Table 4-3 shows this data.

Sent Data	Input/Output with MSM6404A	Main Data Transmitted
STATUS 0	OUT	• Designation of communication method with VTRs. • Designation of CONTROL-S communication guide code. • Flashing LED ("PLAYER" or "RECORDER").
DATA 0	OUT	• Command code to VTRs (sent by CONTROL-L code).
STATUS 1	IN	• Setting communication method with VTR. • Setting CONTROL-S communication guide code. • Presence of transmission trouble • Presence of communication error.
DATA 1 – 4	IN	• VTR operation mode and counter value. (WORD4 to WORD7 of CONTROL-L communication are sent)

Table 4-3

2) Display

Display data sent to the LCD driver μPD7225G (IC4) is 8-bit serial data.

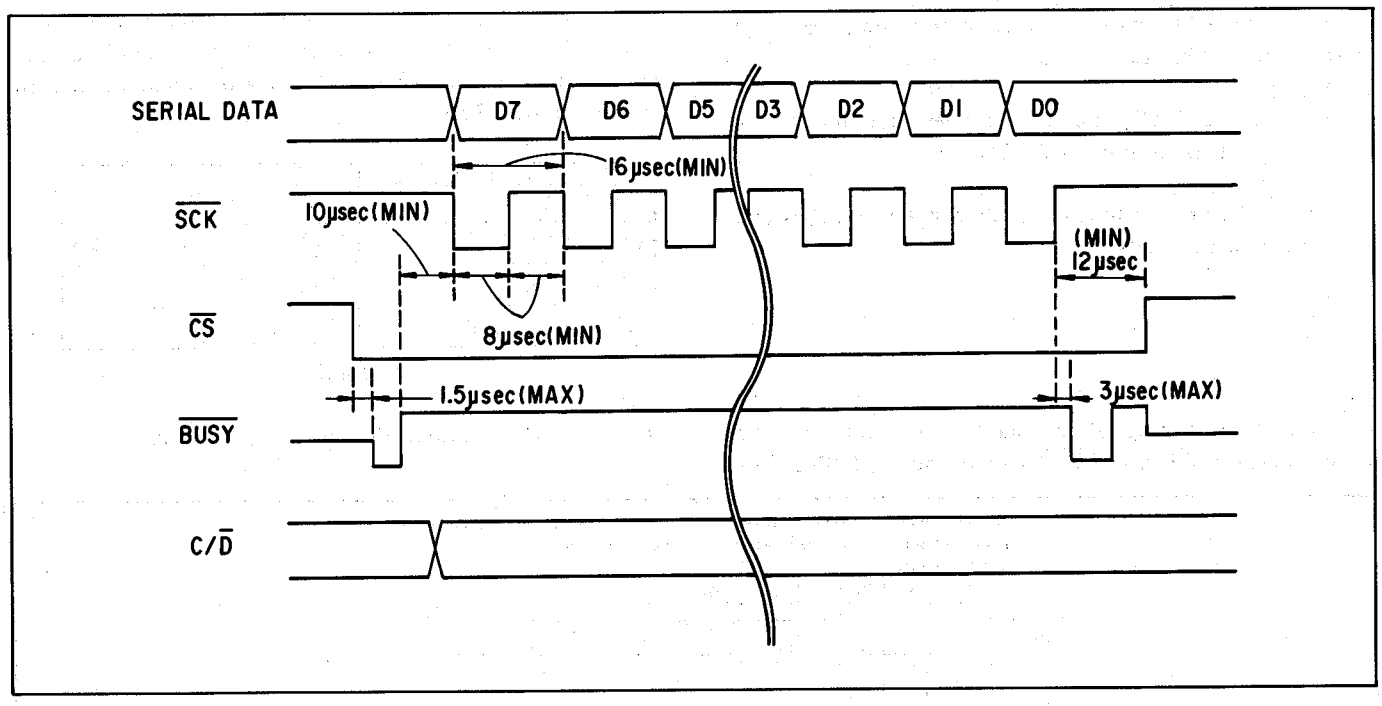


Fig. 4-2 Display Data Transmission Timing Chart

3) Key input

Key input is detected by timer interrupt by an internal timer programmed in MSM6404A at a detection period of 50.048 msec. Table 4-4 shows the key matrix.

IN / OUT	Y_3	Y_2	Y_1	Y_0
X_7				
X_6				
X_5	COUNTER RESET	PLAYER	BOTH	RECORDER
X_4		C	← PGM	PGM →
X_3	LAP	◁◁	□	▷▷
X_2	PGM PLAY	PGM MEMORY	▷	▯▯
X_1	PREVIEW	PGM EDIT	REC	VIDEO EDIT
X_0				

Table 4-4

5. COMMUNICATION MICROPROCESSORS (IC2, IC3: MSM6402A)

5-1. SPECIFICATION

MSM6402A is a CMOS 4-bit microprocessor with the following specification:

- 2 K x 8 bits On-chip mask ROM contained
- 128 x 4 bits On-chip RAM contained (including stack region)
- Command execution time 2μsec (clock is 2MHz)
- 42-pin DIP package

5-2. PIN FUNCTIONS

Pin No.	Port Name	IN/OUT	Signal Name	Function
1	P40	O	PL	LED lighting output
2	P41			Not used
3	P42			
4	P43			
5	P30	O	$\overline{REQ}$	Output of data transfer request signal ti IC1
6	P31	I	$\overline{CS}$	Input of chip select signal from IC1
7	P32	O	$\overline{CONT\text{-}S}$	CONTROL-S signal (MITSUBISHI code infrared remote control signal) output
8	P33	O	PAUSE	CAMERA PAUSE signal output
9	OSC 0	I	OSC 0	Clock oscillating element connection pin (input)
10	$\overline{OSC\ 1}$	O	$\overline{OSC\ 1}$	Clock oscillating element connection pin (output)
11	$\overline{RESET}$	I	$\overline{RESET}$	Reset input
12				Not used
13	P20	I	$\overline{INT}$	CONTROL-L communication interupt input
14	P21			Not used
15	P22			
16	P23			
17	P00			
18	P01	I	$\overline{SCK\text{-}N}$	Serial clock signal input (for N-system communications)
19	P02	O	SO	CONTROL-L output signal
20	P03	I	SI	CONTROL-L input signal
21	Vss		Vss	Ground pin
22	P10	I	VTR2/$\overline{VTR1}$	CONTROL-S guide code selection input
23	P11	I	CONT-L/$\overline{CONT}$	CONTROL-L/CONTROL-S selection switch input
24	P12	I	S/$\overline{V}$	SONY/VHS communication system selection switch input
25	P13			Not used
26	P80	I/O	D4	Internal communication data input/output with MSM6404A
27	P81	I/O	D5	
28	P82	I/O	D6	
29	P83	I/O	D7	
30	P70	I/O	D0	
31	P71	I/O	D1	
32	P72	I/O	D2	
33	P73	I/O	D3	
34	P60			Not used
35	P61			
36	P62			
37	P63			
38	P50			
39	P51			
40	P52			
41	P53			
42	V_{DD}		V_{DD}	Power supply

Table 5-1

5-3. MSM6402A OPERATION

- The switch setting of Pin (22) (VTR2/$\overline{\text{VTR1}}$), Pin (23) (CONTROL-L/$\overline{\text{CONTROL}}$), and Pin (24) (S/V) decides the communication system for communications with the VTRs. IC3 of the replay VTR is fixed to CONTROL-L communications. The decision result is transmitted to MSM6404A (IC1) by internal communications (STATUS 1).
- In internal communications with MSM6404A, status (communication system designation, LED flashing, etc. . . . STATUS 0) and command to the VTRs (DATA 0) are received. At the same time, the status mentioned earlier (STATUS 1) and data from the VTRs (VTR operation modes and counter values . . . DATA 1 – DATA 4) are sent.
- Provides communications with the VTRs.

  [In CONTROL-L communications]

  The command to the VTRs is placed in the CAMERA transmission area (WORD 0, WORD 1) of the CONTROL-L signal. The command code of internal communicationnDATA 0 is sent with WORD 1 and the transmission devide code (the REMOTE COMMANDER code with this equipment) with WORD 0. At the same time, WORD 4 to WORD 7 (VTR operation modes and counter values) are received.

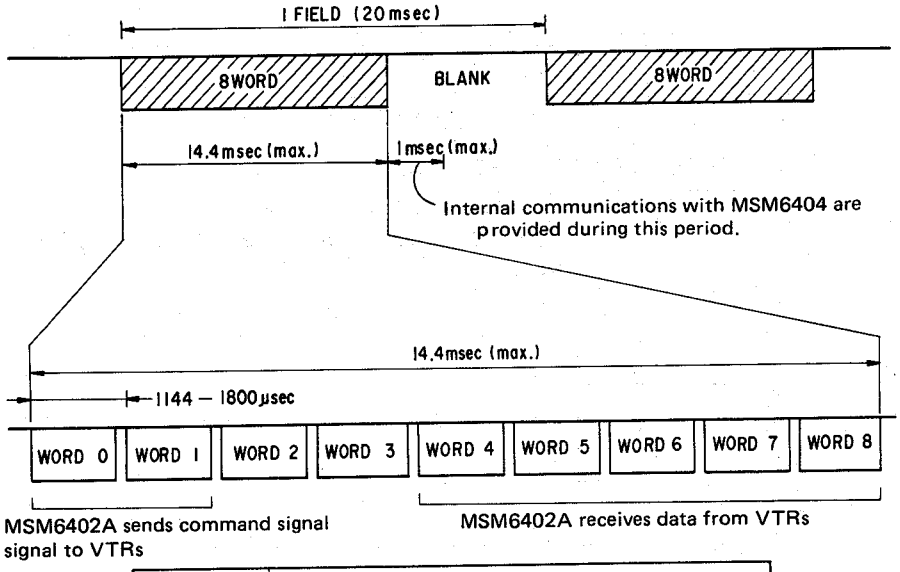
  [In CONTROLS-S communications (IC2 only)]

  CONTROL-S is one-way communications for transmission only. A signal consists of a data code and category code. The command code of internal commmunication DATA 0 is placed in the data code, and guide code (VTR1/VTR2), in the category code. The level of the PAUSE pin (Pin (8)) becomes "H" only when the PAUSE code is sent to output a SONY CAMERA REMOTE signal.

  [In MITSUBISHI code infrared remote control communications (IC2 only)]

  One-way communications as in CONTROL-S, but not a VTR1/VTR2 guide code.

  VICTOR COMPANY OF JAPAN/MATSUSHITA CAMERA PAUSE signal will be output during output of a PAUSE signal.



WORD 0	Transmission device code and WORD 1 guide code
WORD 1	Command to VTRs
WORD 2, WORD 3	VTR containing a tuner, TT unit, etc. transmit
WORD 4	VTR operation mode
WORD 5	VTR status and guide codes of WORDs 6 and 7
WORD 6, WORD 7	Counter value and VTR status

Fig. 5-1 Configuration of CONTROL-L Communications

1) CONTROL-L communications

CONTROL-L communications are field-synchronizing communications of the configuration shown in Fig. 5-1. The first bit (start bit) of each word is output by the VTRs. The equipment connected to the VTRs detects this start bit to send or receive data. Therefore, the VTRs decide the field synchronization (20μsec = V period) and word period (1144 – 1800μsec) are decided by the VTRs. Fig. 5-2 shows the timing chart when MSM6402A is transmitting signals. The level of Pin SO remains constant at "H" during reception.

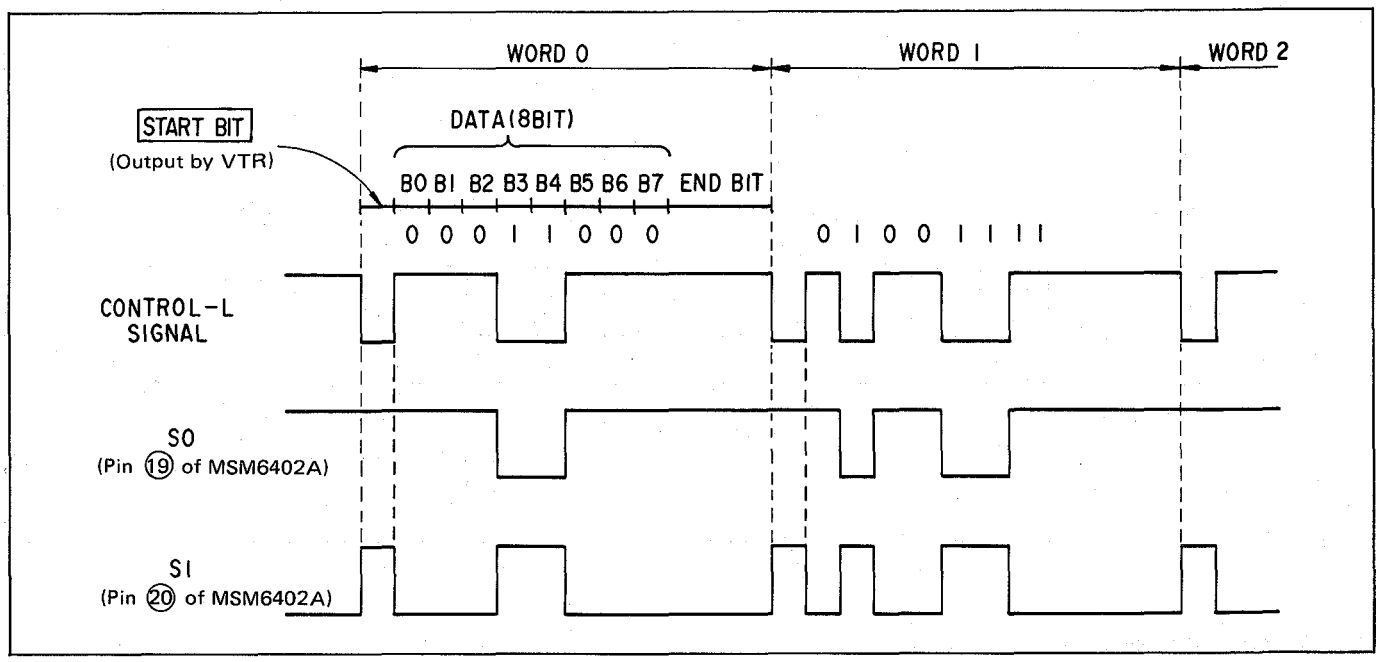


Fig. 5-2 CONTROL-L Timing Chart

[Detection of communication errors and transmission trouble]

MSM6402A detects communication errors and transmission trouble during CONTROL-L communications. The detection results are sent to MSM6404A via internal communications (STATUS 1). "ERROR" will be indicated on the LCD if a communication error or transmission trouble occurs.

Communication error:

1. A communication error results if a field period detected exceeds a certain time.
2. A communication error results if there aren't more than three end bits.

Transmission trouble:

1. Transmission trouble results if the transmission code of MSM6402A Pin ⑲ (SO) output and transmission code placed on the communication line and returned to Pin ⑳ (S1) do not match in comparison.

2) CONTROL-S communications

CONTROL-S communications are one-way communications from the editing controller to the VTRs. The signal configuration of them is shown in Fig. 5-3. A command code ("PAUSE") is output to the recording VTR ten frames continuously at the editing point during PROGRAM EDIT. A command code is output during remote control operation as long as a function key is pressed.

A "PAUSE" signal is output from the CAMERA REMOTE terminal as long as the PAUSE command is sent.

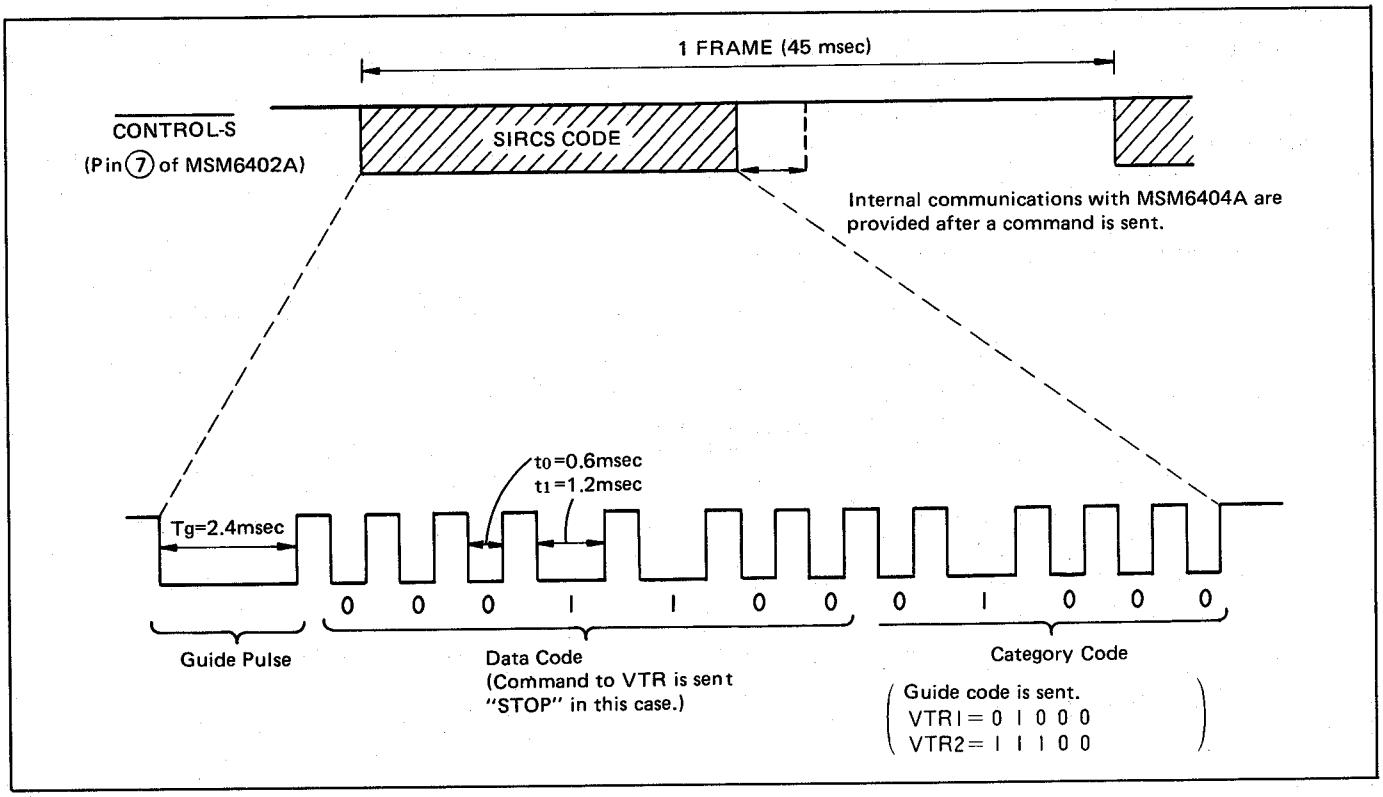

1 FRAME (45 msec)
CONTROL-S
(Pin⑦ of MSM6402A)
SIRCS CODE
Internal communications with MSM6404A are provided after a command is sent.
t0=0.6msec
t1=1.2msec
Tg=2.4msec
0 0 0 1 1 0 0 0 1 0 0 0
Guide Pulse
Data Code
(Command to VTR is sent "STOP" in this case.)
Category Code
Guide code is sent.
VTR1=0 1 0 0 0
VTR2=1 1 1 0 0

Fig. 5-3 CONTROL-S Communication Configuration

3) MITSHUBISHI code infrared remote-control communications

MITSUBISHI code infrared remote control communications are one-way communications as in CONTROL-S communications.

4) CAMERA REMOTE communications

Three systems are available in CAMERA REMOTE communications. They are SONY, MATSUSHITA, and VICTOR COMPANY OF JAPAN systems.

SONY system:

A CAMERA PAUSE signal is output only when a PAUSE code of the CONTROL-S signal is output.

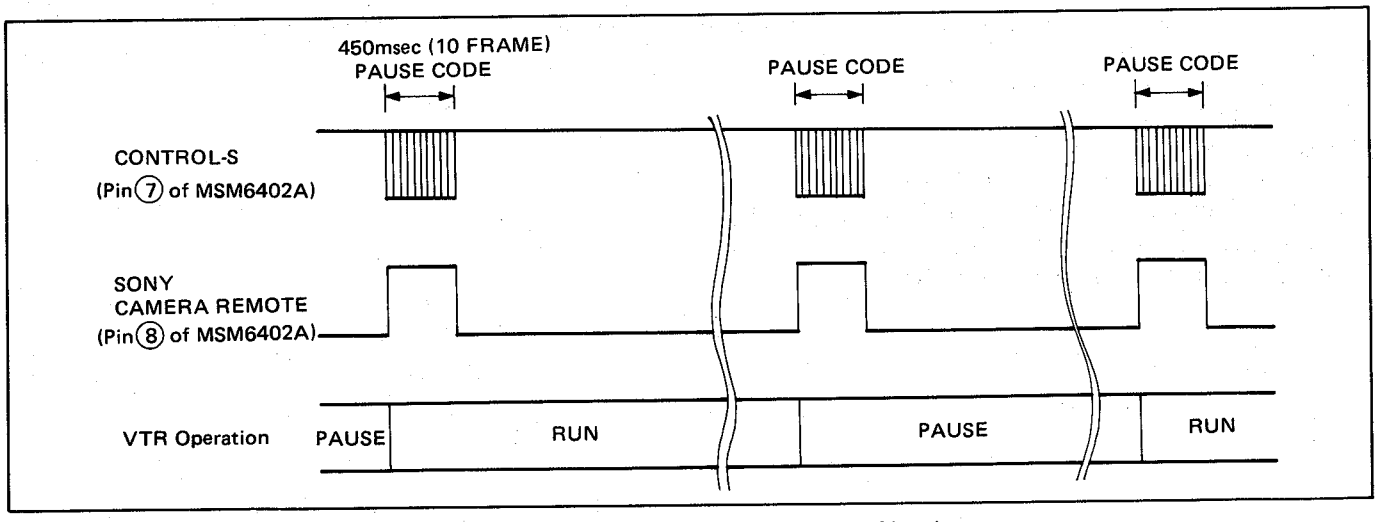


Fig. 5-5 SONY CAMERA REMOTE Signal

VHS system:
A CAMERA PAUSE signal inverts when a PAUSE code of the VHF infrared remote control signal is output.

VICTOR COMPANY OF JAPAN/MATSUSHITA (NATIONAL/PANASONIC) system:
The CAMERA PAUSE signal is interted "H" and "L" while the PAUSE signal of the MITSUBISHI code (infrared remote control code of CCIR Betamax) is output. PAUSE is set up in an initial condition. (This system does not have PAUSE ON/OFF toggle as in the SONY system.)

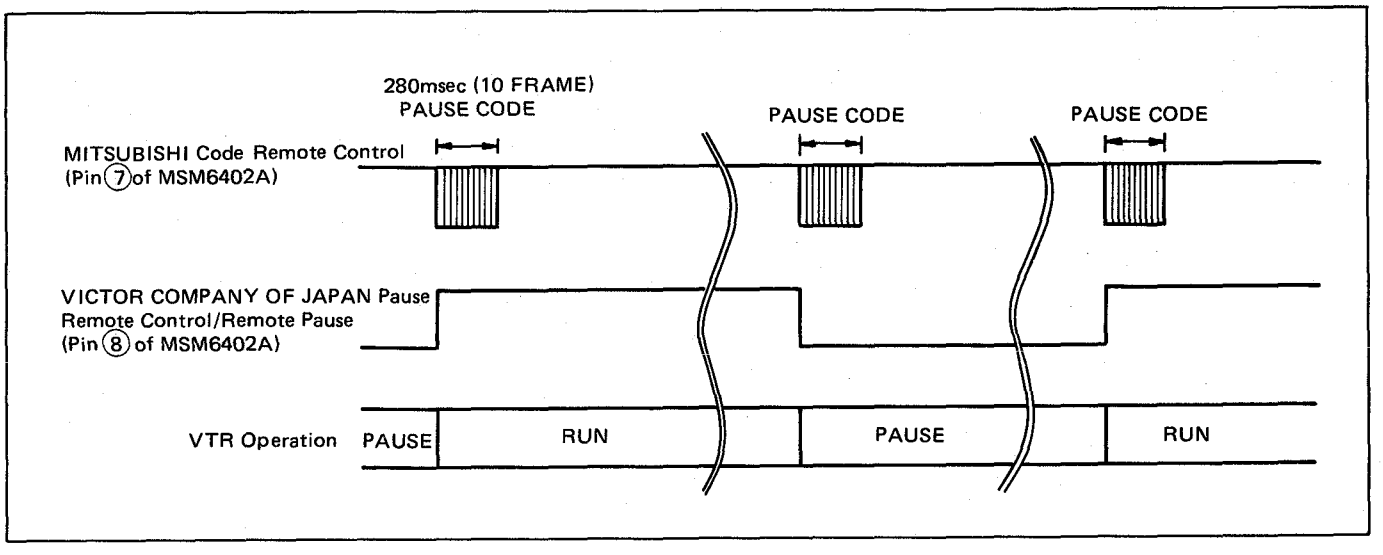


Fig. 5-6 VICTOR COMPANY OF JAPAN CAMERA REMOTE Signal

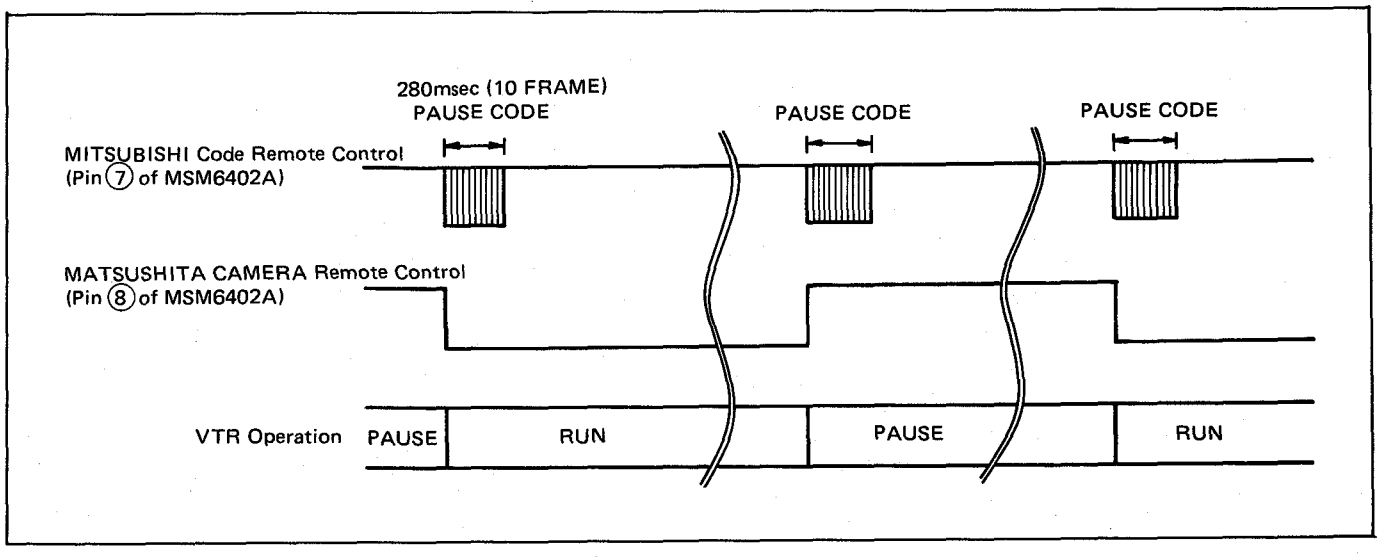


Fig. 5-7 MATSUSHITA CAMERA REMOTE Signal